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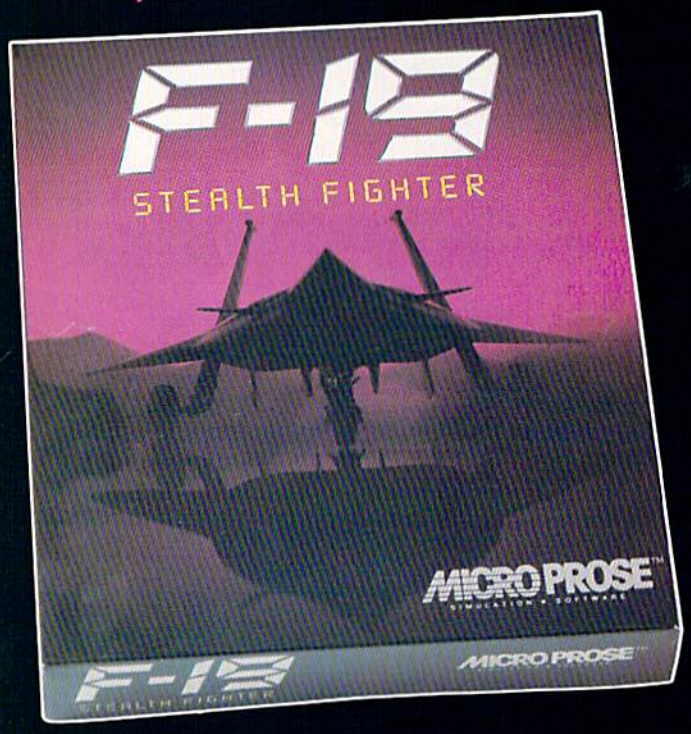

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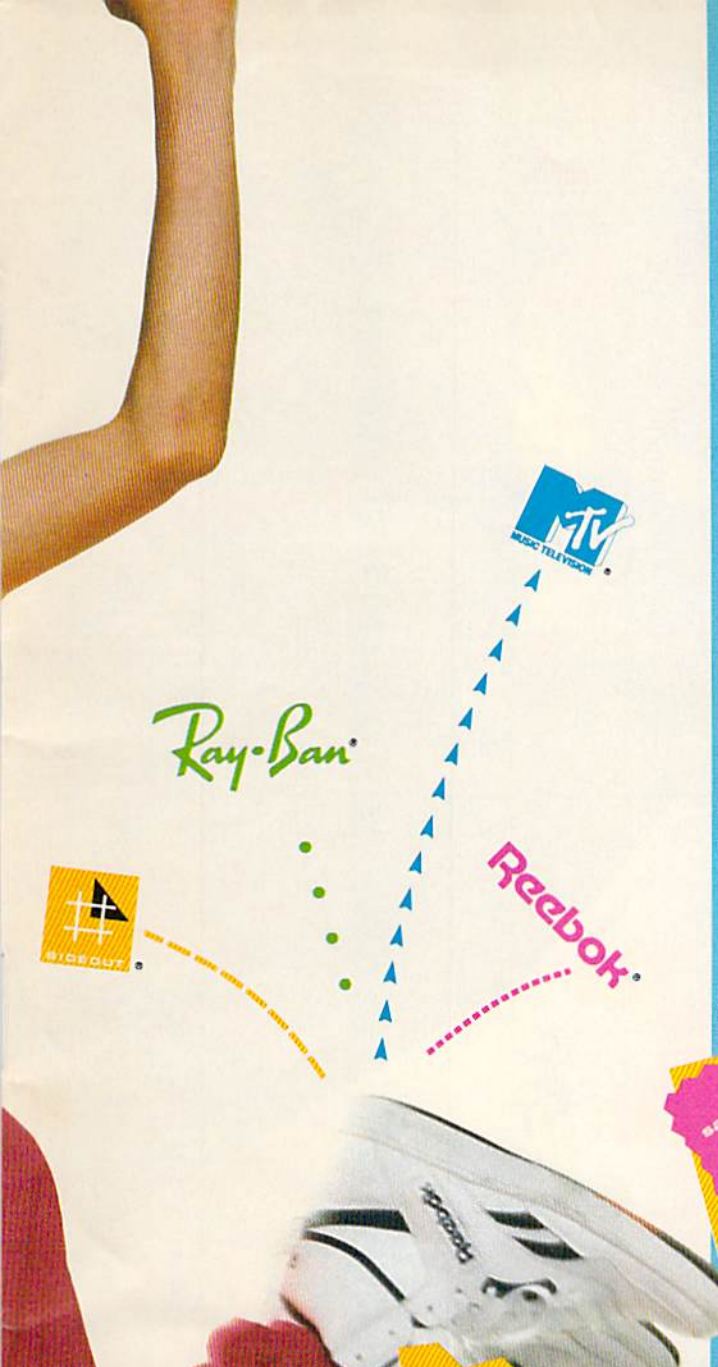

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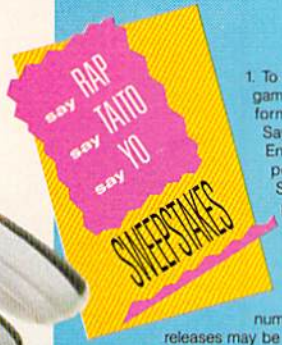

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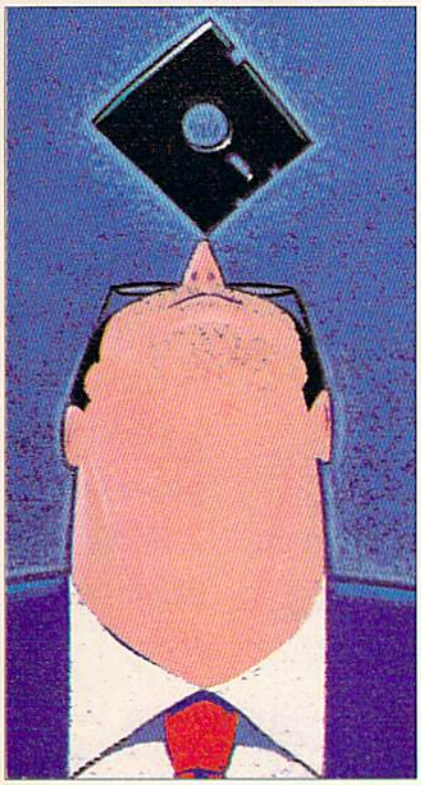
VOLUME 6, NUMBER 10 OCTOBER 1989



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RUN (ISSN 0741-4285) is an independent journal not connected with Commodore Business Machines, Inc. *RUN* is published monthly by IDG Communications/Peterborough, Inc., 80 Elm St., Peterborough, NH 03458. Phone 603-924-9471. Second-class postage is paid at Peterborough, NH, and at additional mailing offices. Canadian second-class mail registration number is 9565. Subscription rates in U.S. are $22.97 for one year, $34.97 for two years and $48.97 for three years. In Canada and Mexico, the one-year subscription rate is $27.97, with U.S. funds drawn on a U.S. bank. Foreign surface mail subscriptions are $42.97 for one year, and foreign air mail one-year subscriptions are $77.97, with U.S. funds drawn on a U.S. bank. *RUN* is nationally distributed by International Circulation Distributors. **Postmaster**: Send address changes to *RUN*, Subscription Services, PO Box 58711, Boulder, CO 80322-8711. (Canadian address changes to *RUN*, PO Box 1051, Fort Erie, Ontario, Canada L2A 5N8.)

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* If you find typing in these listings too tedious, they are available on the September–October 1989 ReRUN disk for $16.47. To order, see page 36.

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RUNning Ruminations

What new software can Commodore owners look forward to in the coming months?

For those computerists with an itchy firebutton finger and rapid-fire reflexes, the news is as refreshing as the return of Indiana Jones. But, if your idea of fun is turning on sprites or looping For-Next statements, then the steady diet of game software is about as welcome as a Rambo remake.

Since consumer buying patterns dictate the direction of the market, many users are obviously purchasing entertainment software. But this emphasis on games may be accelerating the demise of the market.

Remember when Commodore owners were in the majority?

I occasionally receive letters from readers explaining their decision to abandon their Commodore eight-bits for an Amiga or IBM clone. They generally cite the need to move to a "more serious" computer, away from "toy" machines and a market preoccupied with games.

Some Commodore users whose computing needs have changed *should* upgrade to a new computer—even though some models may carry a higher price tag than a BMW.

Most users, however, will get along just fine with their existing computers. How many times have you heard a Commodore owner exclaim, "I can do this, that and the other thing with my little eight-bit that would cost as much as a college education on another computer." They take pride in their ability—and in their machine's capacity for performing at a level of some of the higher-priced computers—to write an article, maintain records, publish banners or newsletters, create music, teach math or spelling skills, and so forth.

As *RUN*'s feature article details, games are hot right now. Software developers are running over one another trying to get the best games out on the market. As you've probably heard before, any activity in the market—even games—is better than none. And obviously these products are satisfying a need among consumers, Commodore owners and *RUN* readers; otherwise, these developers wouldn't stay in business for long.

But anyone who sees only games when looking at the Commodore eight-bit computers isn't paying attention. Commodore computers can be used for much more than just games. Millions of users know that. Now, if someone would just tell the software developers.

When *former* Commodore owners outnumber *present* Commodore owners, it'll be time to ask what has happened to the market. Has the development community, with their collective eyes on the success of the Nintendo craze, failed to keep up with the needs of the user? Or is the user guilty of a lack of imagination in getting the most from his or her computer?

Dennis Brisson

Dennis Brisson
Editor-in-Chief

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MAGIC

A pumpkin, 80-column characters and a whirling-dervish effect for the C-64 are but a sampling of the pure graphics bonanza in this month's Magic!

Compiled by TIM WALSH

$555 IT'S THE GREAT PUMPKIN, CHARLIE BROWN!

Just in time for trick-or-treat season, *RUN* readers can prepare for Halloween by typing in C-64 Halloween Treat. The glowing, spooky pumpkin will delight children of all ages. Set your computer monitor in a window so that little ghosts and goblins can see it as they make their neighborhood rounds.

```
Ø REM C-64 HALLOWEEN TREAT - KURT EHLAND
                                        :REM*245
1Ø FOR T=832 TO 894:READA:CK=CK+A:POKE T,A
   :NEXT:PRINTCHR$(147)                 :REM*33
2Ø IF CK <> 6719 THENPRINT "ERROR IN DATA
   ":END                                :REM*22
3Ø CK=Ø:FORT=49151 TO 49198:READ B:CK=CK+B
   :POKE T,B:NEXT                       :REM*3
4Ø IF CK <> 5Ø58 THENPRINT"ERROR IN DATA":
   END                                  :REM*5Ø
5Ø B=53248:POKEB+21,1:POKE2Ø4Ø,13:POKEB+39
   ,8:POKEB+38,Ø:POKE B+27,1            :REM*145
6Ø POKE B,163:POKE B+1,12Ø:POKE B+23,1:POK
   E B+29,1:POKE B+32,Ø:POKE B+33,Ø:REM*51
7Ø SYS 49152:POKE 646,15:POKE B+28,1:POKE
   B+37,5                               :REM*55
8Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,5,Ø,Ø,2Ø,Ø,Ø,8
   Ø,Ø,2,17Ø,Ø,1Ø,17Ø,128,42,17Ø,16Ø
                                        :REM*188
9Ø DATA 17Ø,17Ø,168,171,171,168,175,171,23
   2,17Ø,186,168,17Ø,186,168,17Ø,17Ø
                                        :REM*121
1ØØ DATA 168,19Ø,238,248,175,255,232,17Ø,2
    54,168,42,17Ø,16Ø,1Ø,17Ø,128,Ø,Ø,Ø
                                        :REM*1Ø5
11Ø DATA Ø,12Ø,169,15,141,2Ø,3,169,192,141
    ,21,3,16Ø,Ø,88,96,174,Ø,193,232:REM*9Ø
12Ø DATA 142,Ø,193,224,4,176,8,169,7,141,3
    8,2Ø8,76,49,234,169,Ø,141,38,2Ø8
                                        :REM*2Ø2
13Ø DATA 17Ø,142,Ø,193,76,49,234,32
                                        :REM*126
```

—KURT EHLAND, PHOENIXVILLE, PA

$556 TWO C-64 SCREENS

After you type in, save and run Two C-64 Screens, you get just that—two independent 40-column screens displayed on the C-64. Just press the Commodore and control keys at the same time to toggle between the two screens. You can execute commands from each screen, display notes or directories on an unused screen, and find many uses for putting this interesting and unique technique to work within your own programs.

```
Ø REM TWO C-64 SCREENS - DAVE PAMPREEN
                                        :REM*158
1Ø FOR T= 49152 TO 49266:READ D:POKE T,D:C
   K=CK+D:NEXT                          :REM*72
2Ø IF CK <> 14792 THEN PRINT"ERROR IN DATA
   ...":END                             :REM*41
3Ø SYS 49152:FOR A =52224 TO 53224:POKE A,
   32:NEXT                              :REM*5Ø
4Ø DATA 162,1Ø6,16Ø,192,142,2Ø,3,14Ø,21,3,
   96,76,49,234,174,141,2,224,6         :REM*1Ø2
5Ø DATA 2Ø8,246,162,Ø,189,Ø,4,188,Ø,2Ø4,15
   7,Ø,2Ø4,152,157,Ø,4,189,2ØØ,4        :REM*228
6Ø DATA 188,2ØØ,2Ø4,157,2ØØ,2Ø4,152,157,2Ø
   Ø,4,189,144,5,188,144,2Ø5,157        :REM*14Ø
7Ø DATA 144,2Ø5,152,157,144,5,189,88,6,188
   ,88,2Ø6,157,88,2Ø6,152,157,88,6:REM*219
8Ø DATA 189,32,7,188,32,2Ø7,157,32,2Ø7,152
   ,157,32,7,232,224,2ØØ,2Ø8,186        :REM*4Ø
9Ø DATA 32,159,255,174,141,2,224,6,24Ø,246
   ,76,11,192,166,2Ø7,224,Ø,2Ø8         :REM*52
1ØØ DATA 155,76,14,192                  :REM*91
```

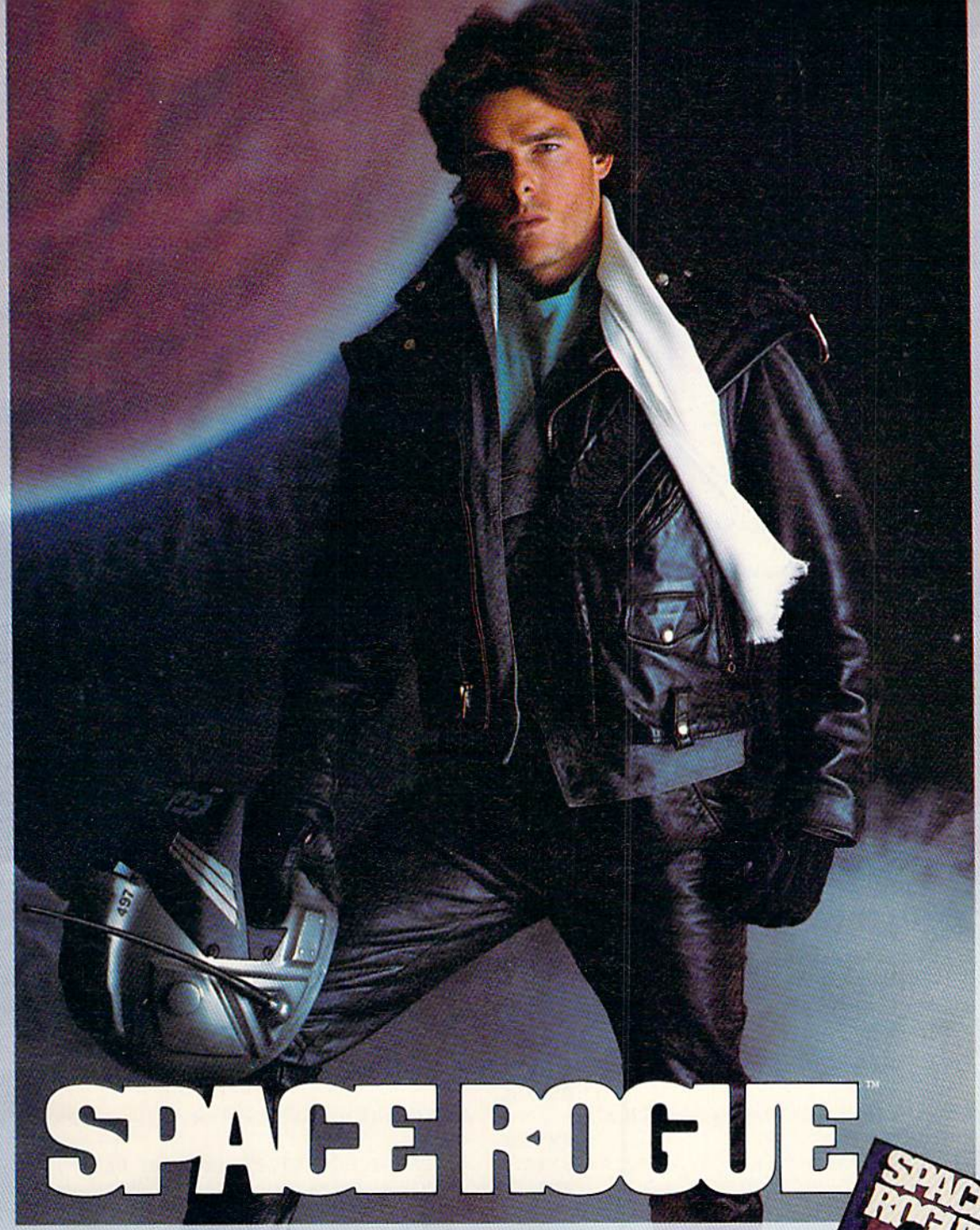
—DAVE PAMPREEN, BELLEVILLE, MI

$557 80-COLUMN C-64 CHARACTERS

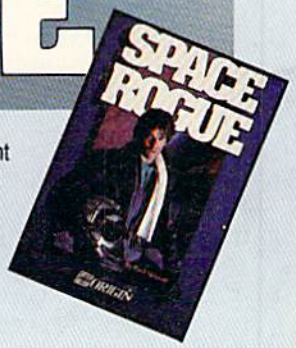
A bit-mapped graphics screen, such as GEOS, used to be the only easy way to display 80-column characters on the C-64's 40-column screen. My Magic trick, 40 Into 80, solves that problem by creating a 20-block sequential file with 40-column characters that are half their normal width. When run, 40 Into 80 also shrinks any characters on the screen into half their size.

Clever and ambitious programmers can use the sequential file of half-width characters to create an 80-column screen editor for putting those characters to use. The *C-64 Programmer's Reference Guide* is an excellent source of information for performing such a feat.

```
Ø REM 4Ø INTO 8Ø - JAY TAPLIN           :REM*151
1Ø PRINT"ABCDEFGHIJKLMNOPQRSTUVWXYZ,./:;12
   3456789Ø+-"                          :REM*9
2Ø DIMY(512):OPEN2,8,2,"@Ø:CHARADATA,S,W"
                                        :REM*139
3Ø POKE52,48:POKE56,48                  :REM*58
4Ø POKE56334,PEEK(56334)AND254          :REM*193
5Ø POKE1,PEEK(1)AND251                  :REM*56
6Ø FORI=ØTO511:Y(I)=PEEK(I+53248):NEXT  ►
```



SPACE ROGUE™



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Circle 58 on Reader Service card.

```
                                        :REM*185
7Ø POKE1,PEEK(1)OR4                     :REM*35
8Ø POKE56334,PEEK(56334)OR1             :REM*171
9Ø POKE53272,(PEEK(53272)AND24Ø)+12 :REM*4
1ØØ FORQW=1TO2:Z=128:IFQW=2THENGOSUB21Ø
                                        :REM*128
11Ø FORR=Ø+NTO511+N:C=Ø:T=Z:Q=64:W=Y(R-N):
    D=1:FORJ=ØTO7                       :REM*189
12Ø IFD=1THEND=2:GOTO14Ø                :REM*19
13Ø IFD=2THEND=1                        :REM*187
14Ø IFJ=7THENGOTO19Ø                    :REM*234
15Ø IFQ>WANDD=1THENQ=Q/2:T=T/2:NEXTJ:NEXTR
    :GOTO21Ø                            :REM*165
16Ø IFQ>WANDD=2THENQ=Q/2:NEXTJ:NEXTR:END
                                        :REM*1ØØ
17Ø IFD=2THENC=C:W=W-Q:Q=Q/2:NEXTJ,R:END
                                        :REM*15
18Ø IFD=1THENC=C+T:W=W-Q:Q=Q/2:T=T/2:NEXTJ
    :NEXT                               :REM*211
19Ø POKER+12288,C:PRINT#2,C:NEXTJ:NEXTR:NE
    XTQW:CLOSE2                         :REM*247
2ØØ END                                 :REM*73
21Ø Z=8:N=512:RETURN                    :REM*251
```

—JAY TAPLIN, HAMPDEN, ME

$558 20-COLUMN C-64 CHARACTERS

Residing at the other end of the C-64 screen spectrum is 40 Into 20, which creates screen characters twice as wide as the normal 40-column characters. A simple screen editor is built into this program to support the double-wide characters, which are not displayed by the standard 40-column screen editor.

To exit 40 Into 20, enter POKE 56576,(PEEK(56576)AND 252)+3:POKE 648,4. Pressing run-stop/restore will exit the program, but it also locks up the screen. Just enter POKE 648,4 to unlock the screen.

```
Ø REM 4Ø- INTO 2Ø-COLUMNS - DAVID FICKEN
                                        :REM*56
1Ø REM SYS49152 ACTIVATES NEW CHSET
                                        :REM*226
2Ø FORI=49152TO49431:READA:POKEI,A:X=X+A:N
   EXT                                  :REM*157
3Ø IFX<>34524THENPRINT"ERROR IN DATA":END
                                        :REM*139
4Ø SYS49152                             :REM*214
5Ø DATA 173,Ø,221,41,252,17Ø,232,232,142,Ø
   ,221,169,68,141,136,2,169,Ø,133:REM*21Ø
6Ø DATA 253,133,251,169,2Ø8,133,252,169,8Ø
   ,133,254,16Ø,Ø,169,21Ø,141,6Ø,3:REM*249
7Ø DATA 32,63,192,169,Ø,133,253,133,251,16
   9,212,133,252,169,82,133,254     :REM*75
8Ø DATA 169,214,141,6Ø,3,32,63,192,96,169,
   Ø,141,14,22Ø,169,51,133,1,177    :REM*137
9Ø DATA 251,141,23,193,169,55,133,1,169,1,
   141,14,22Ø,32,127,192,24,165     :REM*187
1ØØ DATA 251,1Ø5,1,133,251,165,252,1Ø5,Ø,1
    33,252,24,165,253,1Ø5,1,133,253
                                        :REM*122
11Ø DATA 165,254,1Ø5,Ø,133,254,165,251,2Ø8
    ,2ØØ,165,252,2Ø5,6Ø,3,2Ø8,193,96
                                        :REM*77
12Ø DATA 169,Ø,141,21,193,141,22,193,173,2
    3,193,41,128,24Ø,8,173,21,193,9
                                        :REM*1Ø4
13Ø DATA 192,141,21,193,173,23,193,41,64,2
    4Ø,8,173,21,193,9,48,141,21,193
                                        :REM*13Ø
14Ø DATA 173,23,193,41,32,24Ø,8,173,21,193
    ,9,12,141,21,193,173,23,193,41   :REM*41
15Ø DATA 16,24Ø,8,173,21,193,9,3,141,21,19
    3,173,23,193,41,8,24Ø,8,173,22:REM*1Ø1
16Ø DATA 193,9,192,141,22,193,173,23,193,4
    1,4,24Ø,8,173,22,193,9,48,141,22
                                        :REM*76
17Ø DATA 193,173,23,193,41,2,24Ø,8,173,22,
    193,9,12,141,22,193,173,23,193   :REM*37
18Ø DATA 41,1,24Ø,8,173,22,193,9,3,141,22,
    193,173,21,193,145,253,165,254:REM*244
19Ø DATA 72,24,1Ø5,4,133,254,173,22,193,14
    5,253,1Ø4,133,254,96,255,255,255
                                        :REM*54
2ØØ PRINT"{SHFT CLR}{CTRL 2}{7 CRSR DNs}"
                                        :REM*2Ø2
21Ø FORI=ØTO127:POKE174Ø8+I*2,I:POKE174Ø8+
    I*2+1,I+128:NEXT                    :REM*91
22Ø PRINTCHR$(16Ø)CHR$(16Ø)"{2 CRSR LFs}";
    :GETA$:IFA$=""THEN22Ø               :REM*82
23Ø PRINT"{2 SPACEs}{2 CRSR LFs}"A$CHR$(18
    )A$CHR$(146);:GOTO22Ø               :REM*154
```

—DAVID M. FICKEN, TOPSAIL, NFLD., CANADA

$559 WHIRLING DERVISH 64

Set your entire text screen whirling with Whirling Dervish 64, a short machine utility that provides a truly spectacular animation effect. Just type in and save the program, run it, and enter SYS 49152 to activate it. Entering SYS 49155 stops the action, should you want to give your eyes a rest.

```
Ø REM WHIRLING DIRVISH 64 - JEFFREY PANICI
                                        :REM*73
1Ø PRINTCHR$(147)"CHECKING DATA";:CK=.:S=4
   9152:FORX=STOS+19Ø:READD:CK=CK+D
                                        :REM*242
2Ø POKEX,D:PRINT".";:NEXT:IFCK<>16666THENP
   RINT"ERROR!!!":END                   :REM*229
3Ø PRINT"{CRSR DN}SYS 49152 TO START EFFEC
   T":PRINT"SYS 49155 TO STOP":END  :REM*3
4Ø DATA 76,49,192,76,112,192,Ø,Ø,1,2,3,4,5
   ,6,7,7,7,7,7,6,5,4,3,2,1,Ø,Ø,Ø,4:REM*5Ø
5Ø DATA 5,6,7,7,7,7,6,5,4,3,2,1,Ø,Ø,Ø,Ø,1,
   2,3,4,12Ø,169,88,141,2Ø,3,169,192
                                        :REM*25
6Ø DATA 141,21,3,169,1,141,26,2Ø8,169,Ø,14
   1,18,2Ø8,173,17,2Ø8,41,119,141,17
                                        :REM*237
7Ø DATA 2Ø8,173,22,2Ø8,41,247,141,22,2Ø8,8
   8,96,173,25,2Ø8,41,1,24Ø,11,169,1
                                        :REM*172
8Ø DATA 141,25,2Ø8,32,15Ø,192,76,49,234,1Ø
   4,168,1Ø4,17Ø,1Ø4,64,12Ø,169     :REM*69
```

```
9Ø DATA 128,141,26,2Ø8,169,49,141,2Ø,3,169
   ,234,141,21,3,173,22,2Ø8,41,24Ø:REM*1Ø6
1ØØ DATA 9,8,141,22,2Ø8,173,17,2Ø8,41,24Ø,
    9,11,141,17,2Ø8,88,96,174,6,192
                                  :REM*253
11Ø DATA 173,22,2Ø8,41,248,29,7,192,141,22
    ,2Ø8,173,17,2Ø8,41,248,29,28,192
                                  :REM*133
12Ø DATA 141,17,2Ø8,238,6,192,173,6,192,2Ø
    1,21,144,5,169,Ø,141,6,192,96 :REM*212
```

—JEFFREY D. PANICI, SANDWICH, IL

$55A MOVIE FADE 64/128

When you've finished enjoying Whirling Dervish 64, above, try Movie Fade 64/128. As its name implies, this C-64 and C-128 (40- and 80-Column modes) utility makes screen text fade out as in opening movie credits. Also try running Whirling Dervish 64 with Movie Fade 64/128 to create dynamic special effects. Even Steven Spielberg couldn't draw more attention to your program!

```
Ø REM MOVIE FADE 64/128 - JEFFREY PANICI
                                  :REM*2Ø5
1Ø PRINTCHR$(147):POKE53281,.:POKE5328Ø,.:
   PRINT"{9 CRSR DNs}"            :REM*51
2Ø A$="RUN MAGAZINE PRESENTS":GOSUB8Ø:A$="
   MOVIE FADE 64 & 128":GOSUB8Ø   :REM*33
3Ø A$="MAGIC COLUMIST":GOSUB8Ø    :REM*57
4Ø A$="{CTRL 9}TIM WALSH{CTRL Ø}":GOSUB8Ø
                                  :REM*87
5Ø A$="THIS PROGRAM WAS WRITTEN BY":GOSUB8
   Ø:A$="{CTRL 9}JEFFERY D. PANICI{CTRL Ø}
   ":GOSUB8Ø                      :REM*73
55 A$="PRODUCED BY":GOSUB8Ø:A$="{CTRL 9}ID
   G COMMUNICATIONS/PETERBOROUGH{CTRL Ø}":
   GOSUB8Ø                        :REM*1Ø7
56 A$="EDITED BY":GOSUB8Ø:A$="{CTRL 9}HARO
   LD R.BJORNSEN{CTRL Ø}":GOSUB8Ø :REM*133
57 A$="DIRECTED BY":GOSUB8Ø:A$="{CTRL 9}{C
   TRL 8}SWAIN PRATT{CTRL Ø}":GOSUB8Ø
                                  :REM*74
6Ø GOTO2Ø                         :REM*184
7Ø REM FADER ROUTINE              :REM*219
8Ø FORX=1TO4Ø:NEXT:CL$="{CTRL 1}{CTRL 7}{C
   OMD 7}{COMD 6}{CTRL 4}{CTRL 2}":TB=(4Ø-
   (LEN(A$)))/2                   :REM*157
9Ø FORX=1TO6:C$=MID$(CL$,X,1):PRINTTAB(TB)
   ;C$;A$;"{CRSR UP}":NEXT        :REM*13
1ØØ FORX=1TO2ØØØ:NEXT             :REM*6Ø
11Ø FORX=6TO1STEP-1:C$=MID$(CL$,X,1):PRINT
    TAB(TB);C$;A$;"{CRSR UP}":NEXT:REM*156
12Ø FORP=1TO5ØØ:NEXT:RETURN       :REM*226
```

—JEFFREY D. PANICI, SANDWICH, IL■

If you have an idea for a way to make computing easier, faster, more exciting and enjoyable, send it to: Magic, RUN Magazine, 80 Elm St., Peterborough, NH 03458.

RUN *pays $10 to $40 for each trick published in the column. If you'd like a copy of the latest edition of* RUN*'s Magic Trick Writer's Guide, send your request with a self-addressed, stamped, business-size envelope; you'll receive a copy in two or three weeks.*

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Circle 166 on Reader Service card.

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- **REU support.** The JiffyDOS commands now fully support Commodore RAM Expansion Units running under RAMDOS. Access your REU just like a disk drive without having to load special wedge utilities.
- **1581 support.** Copy programs and files from 1541 and 1571 drives to any partition on your 1581. Move between partitions easily with just a few keystrokes.
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News and New Products

Commodore hires away another Apple exec, more games for the C-64 appear, and, for a change, there's an application for the C-128.

Compiled by HAROLD R. BJORNSEN

Commodore Picks an Apple

WEST CHESTER, PA—Commodore President Harold Copperman has appointed former Apple Computer executive C. Lloyd Mahaffey as Commodore's Vice President, Marketing. Copperman said he chose him to spearhead the company's more aggressive marketing. Mahaffey was instrumental in Apple's efforts in both education and the Federal Systems Group.

As vice president of marketing, he will work closely with Copperman in his effort to increase sales and marketing support of Commodore products in the business, education, government and consumer markets. "As my associate at Apple, Lloyd was very effective in developing and expanding our efforts in government and education. He is an expert in the marketing of unique microcomputer technology and is an invaluable addition to the Commodore team," said Copperman.

In other news, Commodore has joined the Library of Congress and the American Library Association to act as co-sponsor of the travelling exhibition, "To Make All Laws: The Congress of the United States." The exhibit, based on the Library's permanent exhibition on the history and development of Congress, will visit 30 major American cities.

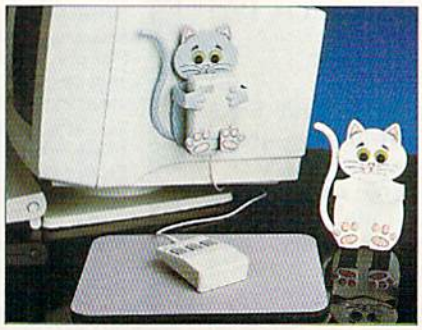
The Cutting Edge

JAFFREY, NH—**Trim Right** is a tool that allows for quick separation of computer paper perforations and also cuts precision edges with an included penknife-type blade. A clamping feature holds paper securely to remove perforations, and an adjustable ruled squaring device keeps paper aligned for exact trimming. It's available for $14.95. Curtis Manufacturing Company, Inc., 30 Fitzgerald Drive, Jaffrey, NH 03452.

Check Reader Service number 402.

Pur-r-r-fect Mouse Holder

LAS VEGAS—H&H Enterprises (4069 Renate Drive, Las Vegas, NV 89103) introduces the **MouseCAT** mouse-device holder. It looks like a kitten and holds the mouse securely between its front paws. MouseCAT comes in light gray or white, with pink ears, nose and paws and green eyes. It attaches to the monitor or other flat surface with Velcro and retails for $6.95.



Let your MouseCAT hold your mouse when you aren't.

Check Reader Service number 401.

✓ It Out

TUSTIN, CA—✓**Book** is a personal checking system available on separate disks for the C-64 and C-128. The program features a non-accounting approach to personal checking management. It handles 17 different types of checking transactions, such as checks, A.T.M. withdrawals, automatic payments, interest and service charges. It also stores names of payees and allows scheduling of periodic transactions. Provided are custom categories to sort out the checking account activity, and these have main and sublevels for specific grouping. The system also handles overdraft protection, does monthly balancing and provides optional password protection for each account. It prints out checks and has an on-screen calculator.

Included with the program is a utility package that features partitioned directory support and backups for 1581 disk drives. The C-128 version requires an 80-column monitor, and both versions require at least one disk drive. Both versions support a variety of printers. Available from Computer Craftware, 17966 Arbolada Way, Tustin, CA 92680 for $34.95, plus $2.50 s/h.

Check Reader Service number 403.

Four from Accolade

SAN JOSE, CA—Accolade (550 S. Winchester Blvd., Suite 200, San Jose, CA 95128) has released four new games for the C-64, at $14.95 each.

Three games in one, **Mental Blocks** challenges the player in a series of brain teasers. In the first game, *Free Fall*, your task is to place falling geometric shapes into a defined space. The *California Achievement Cubes* gives you and another player a cube test, in which you must identify the unfolded version of a cube before your opponent does. In *What's Next Pussycat*, the left side of your brain is put to the test as you attempt to be the first to identify the next geometric shape in a logical sequence of four.

Shoot 'Em Up Construction Kit provides players with tools to create shoot-'em-ups of their own. Three predesigned games are included on the disk, and game designers can choose to tailor any of these to their own specifications or start from scratch to create a unique game. You can build backgrounds, create animation sequences and sound effects, determine the number of game levels and decide the amount of time between each enemy attack wave.

In **Harrier 7**, enemy forces have captured seven military bases in the Straits of Hormuz, cutting off the major oil supplies of the free world. As the pilot of a Harrier fighter jet, you must manipulate your aircraft through the Persian Gulf to locate and destroy the seven enemy rocket bases.

You have eight hours and 12 minutes in **Frightmare** to wake yourself up from your worst nightmare. In this game of over 80 levels, you travel through seven dream states, each more horrifying than the last. With each level you conquer, you gain six minutes on the clock toward waking up.

Check Reader Service number 404. ■

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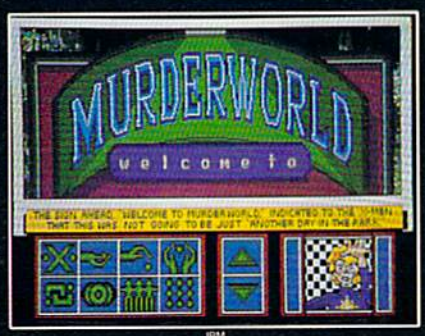
X-MEN



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PARAGON SOFTWARE

Spider-Man now available for C-64 ($34.95) and IBM-PC/Tandy/compatibles ($44.95); due in Aug. 1989 for Amiga. X-Men due in Oct. 1989 for IBM-PC/Tandy/compatibles ($39.95); future releases for C-64 and Amiga. Can't find these games? Call: 301-771-1151 X-208 weekdays 8:30am to 5pm Eastern and order by MC/Visa/AmEx. Or mail check or money order. Prices include shipping in US. Add $5.00 for international orders. US funds only. MD residents add 5% sales tax. Allow 1-3 weeks for US delivery. Price may vary by machine type.

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Circle 56 on Reader Service card.

MAIL RUN

Bemoaning RUN*'s thinner issues, petitioning for Commodore 8-bit support, and gaining extra game lives.*

TWINS?

Michael Cavanaugh's review of Timeworks' GEOS Writer 64 (Software Gallery, *RUN*, April 1989) sounded like a review of Spinnaker's BetterWorking Word Publisher. Are the two programs actually the same program marketed under different names? If so, GEOS owners should be warned so that they won't purchase both.

—ROBERT A. HUNTER
WINDSOR, NFLD., CANADA

Mark L. Goldberg, President of Timeworks, states: "Spinnaker's Word Publisher and Timeworks' GEOS Writer 64 are both similar in function. They were created from the same basic design. However, that's where the similarity ends.

"The Timeworks program includes several fundamental user-interface differences that make it easier and faster to learn and use. The manual was written completely by the Timeworks editorial staff and is quite comprehensive by comparison."

—EDITORS

HUGs, NOT BUGS

As *RUN*'s editor-in-chief, Dennis Brisson, pointed out in May's RUNning Ruminations, Commodore 64 and 128 users feel as if they're being abandoned by Commodore. In light of this, the Heartland Users' Group (HUG) is organizing a nationwide petition campaign of user groups asking that the 8-bit machines be supported, if not by Commodore, then by someone else. User groups may get information by writing HUG, PO Box 281, Cape Girardeau, MO 63702.

—LEE PASBORG
SECRETARY, HUG

HONEY, I SHRUNK *RUN* MAGAZINE

In his July 1989 editorial about the decline in the C-64/128 market, Dennis Brisson stated, "Far from giving up on the market, we see an opportunity here to serve—through the magazine and special disk products—needs that aren't being met." If these brave words are true, then why has there been a decrease in the size of *RUN* since the February 1989 issue?

—GERALD P. O'DONNELL
SAVANNAH, GA

Thinner issues after the winter season in no way indicate a lessening of RUN*'s commitment to its readers, but simply the economic fact of life in the computer publishing business that the volume of ads, always lower after Christmas, has decreased sharply this year.*

—EDITORS

IN COMMODORE WE TRUST?

I'm writing in reaction to Commodore's decision to discontinue the C-128 and C-128D line of computers. This is an ill-fated decision that the company will come to regret, and I'm disappointed that it has so little regard for its customers.

It appears that Commodore is attempting to maneuver its customers into a position of purchasing a higher-priced Amiga system by withholding service, parts and accessories. This would also mean that hundreds of dollars' worth of software must be abandoned by each user for lack of compatibility.

I appreciate my machine, and I have every intention to use it until it dies. Will I ever buy another Commodore computer? I don't think so. I have lost my trust in Commodore.

—JOHN D. MILLER
PITTSBURGH, PA

LIKES H-P'S DESKJET

I found Lou Wallace's article on laser printers ("A Dynamite Combo!," *RUN*, July 1989) interesting and informative. However, if a C-64/128 user is interested in 300 dots-per-inch printing of both graphics and text, the Hewlett-Packard Deskjet is probably a more economical choice. The output is virtually indistinguishable from laser output, the printer has both parallel and serial ports, it takes up less space, and is very quiet. Also, when printing from RAM disk from within GEOS, its speed is really quite impressive.

—T. D. FIFER
HAMTRAMCK, MI

We solicited Hewlett-Packard for just that printer to be reviewed along with the others, but they would not cooperate by lending us a machine to evaluate.

—EDITORS

THAT'S WHY WE CALL IT "FAST-FOOD FRENZY"

I have a couple of tips for your arcade game, "Fast-Food Frenzy," published in last August's issue of *RUN*. You can stop the game at any time by pressing the run-stop/restore key combination. Entering SYS 49152 and pressing the firebutton restarts the game where you left off. Also, if you press run-stop/restore after losing all your lives, but before the "Game Over" message, type in the above SYS command and press the firebutton, and you'll get back the screen with zero lives. Play one round until the screen flashes, press the firebutton, and you'll have 255 lives to your credit!

—BEN SEREBRIN
LAKELAND, FL

We followed your suggestions, Ben, and they work fine. But try hitting the burgers at level nine. Whew!

—EDITORS

GREAT LAKES MISTAKE

If anyone from the Show Me state says, "Oh, sure. Prove to me that this Beach guy is really from Missouri," their well-known skepticism will be well founded. In your August feature article, "Sculptor, Lawyer, Editor-in-Chief," you list my hometown of Elwell as being in Missouri. It's actually in Michigan!

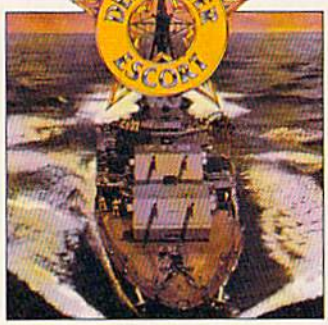
—DALE BEACH
ELWELL, MI ■

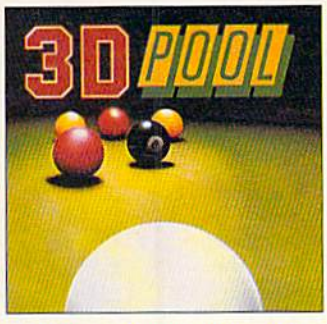
PARAGON | MICROPLAY SOFTWARE | HEWSON

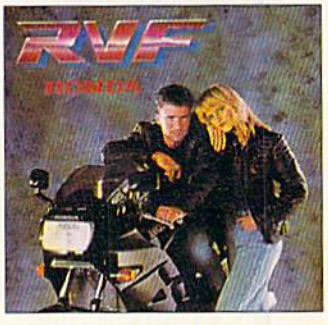
Featured in

MEDAL MADNESS

PLAY TO WIN!







Let The Games Begin.

Playing computer games is fun. Everybody knows that.

Now just *learning* about computer games can be fun, too. And it just might win you a prize.

Medalist International announces Medal Madness, a chance for you to learn about the hottest, most innovative and exciting titles on the market — and be rewarded for it!

Just visit your favorite software retailer between September 15 and October 31, 1989 and look for the Medal Madness counter card. You'll find a tear-off sheet with multiple choice questions about Medalist International games.

Fill out the sheet with your answers and mail it back to Medalist International. Winners will be drawn from among all correct entries received by November 1, 1989.

That's it. Simple contest. Simple rules. Great prizes.

If this is madness, we should all go insane.

GREAT PRIZES!

GRAND PRIZE: Disney World vacation for two, including round trip airfare, hotel for 4 days, 3 nights, and spending money.

2 SECOND PRIZES: Medalist International game library.

25 THIRD PRIZES: The Medalist International game of your choice.

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SOFTWARE GALLERY

In conjunction with Computer Learning Month, here are reviews of programs from math and science to grammar and writing.

Compiled by BETH S. JALA

HIGH/SCOPE SURVEY OF EARLY CHILDHOOD SOFTWARE ..... A

Before You Buy for Your Small Fry, Take a Good Look at this Book!

When it comes to educational software for children, it's a jungle out there. Confused parents encounter many vines waiting to entangle them: Some programs are outdated; not all software runs on all computers; and the child might not fall into the target age for which the software was designed.

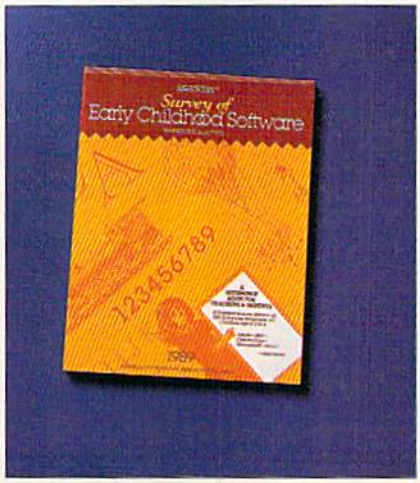
Fortunately, there is a machete on the market that can chop through this mess: High/Scope's Survey of Early Childhood Software. High/Scope is a non-profit organization and receives no money from either publishers or distributors for reviewing the software. This is the fifth year that author Warren Buckleitner has produced the survey.

The 1989 version of the paperback evaluates 355 educational programs and rates them in terms of user friendliness, educational value and instructional design. It covers software designed for children of ages three to ten.

Surprisingly, Commodore-compatible programs make a good showing. Of the 355 programs, 124 are available for Commodore computers, ranking them far ahead of Atari titles (43), slightly ahead of IBM (115), but a distant second behind Apple (307). Most of the highly rated titles are available for several computers, including Commodore.

The book's reviews don't waste words. Nearly all are accompanied by a printout of a sample screen from the program. Here's a synopsis of one review, Baudville's Rainy Day Games.

It has an overall rating of 83 out of a possible 100 points. It was published in 1985 with a suggested retail price of $29.95 and is available for the Apple, C-64, Atari and Macintosh computers. It is designed to help a child's classification abilities using memory practice. Following that overview is the comment: "Contains three card games on one disk: Concentration, Old Maid and Go Fish. Child uses mouse, joystick, arrow keys or Koala Pad to move cards. Three difficulty levels offer range in content. Well designed. Offers good level of child control. Up to three players can play against the computer."



High/Scope's survey evaluates a lot of educational computer programs, including many for the C-64/128.

REPORT CARD

A Superb!
An exceptional program that outshines all others.

B Good.
One of the better programs available in its category. A worthy addition to your software library.

C Average.
Lives up to its billing. No major hassles or disappointments here.

D Poor.
This program has some problems. There are better on the market.

E Failure.
Many problems; should be deep-sixed!

Of the programs reviewed, only 12 percent have a "most recent copyright date" of 1987–88. But just because a program may have been produced three or four years ago, doesn't mean it can't contend with today's releases. Indeed, several of the "outstanding" programs chosen by High/Scope date back to 1984 and 1985.

And child-education software is still coming out for the Commodore. Among the 1987–88 releases are: Dinosaurs Are Forever, Holidays & Seasons, and Letters for You, all from Polarware, Inc.; Simon Says, from Sunburst Communications; and Teddy Bear-rels of Fun, from DLM.

Other nice features of the book include a directory of early-childhood software producers; a list of the 355 products reviewed grouped by the conceptual areas they help develop; and worksheets to show how ratings of the products were done.

High/Scope's survey is an excellent addition to parents', educators' and user groups' libraries. [*Editor's note: Educators may be interested in contacting Commodore's Education department (1200 Wilson Drive, West Chester, PA 19380) for a copy of their Directory of Educational Software. Prepared by the EPIE Institute, it is a comprehensive listing of educational software for the C-64/128; however, the packages are* not *rated.*] *(High/Scope Press, 600 N. River St., Ypsilanti, MI 49198. $19.95.)*

—LONNIE BROWN
LAKELAND, FL

COMP-U-SOLVE ..... A–

Sharpen Your Wits With Tough Puzzles

The idea behind Comp-U-Solve is that all of us in this complex world need to possess well-developed problem-solving skills, and that these can be strengthened through practice with solving puzzles such as this program provides. Whether or not you fully ac- ►

"I Challenge You To Win A Caribbean Vacation!"

—Major "Wild Bill" Stealey
President, MicroProse

Enter "The Major's Mission" Contest and take off to the Caribbean!

Just ask your retailer for details on how to receive your Top Secret documents. They contain your mission orders and a tough set of questions on four of our hottest games: F-19 STEALTH FIGHTER, RED STORM RISING, F-15 STRIKE EAGLE II and M1 TANK PLATOON. To find the answers, read through your documents. Then send in your answers to win!

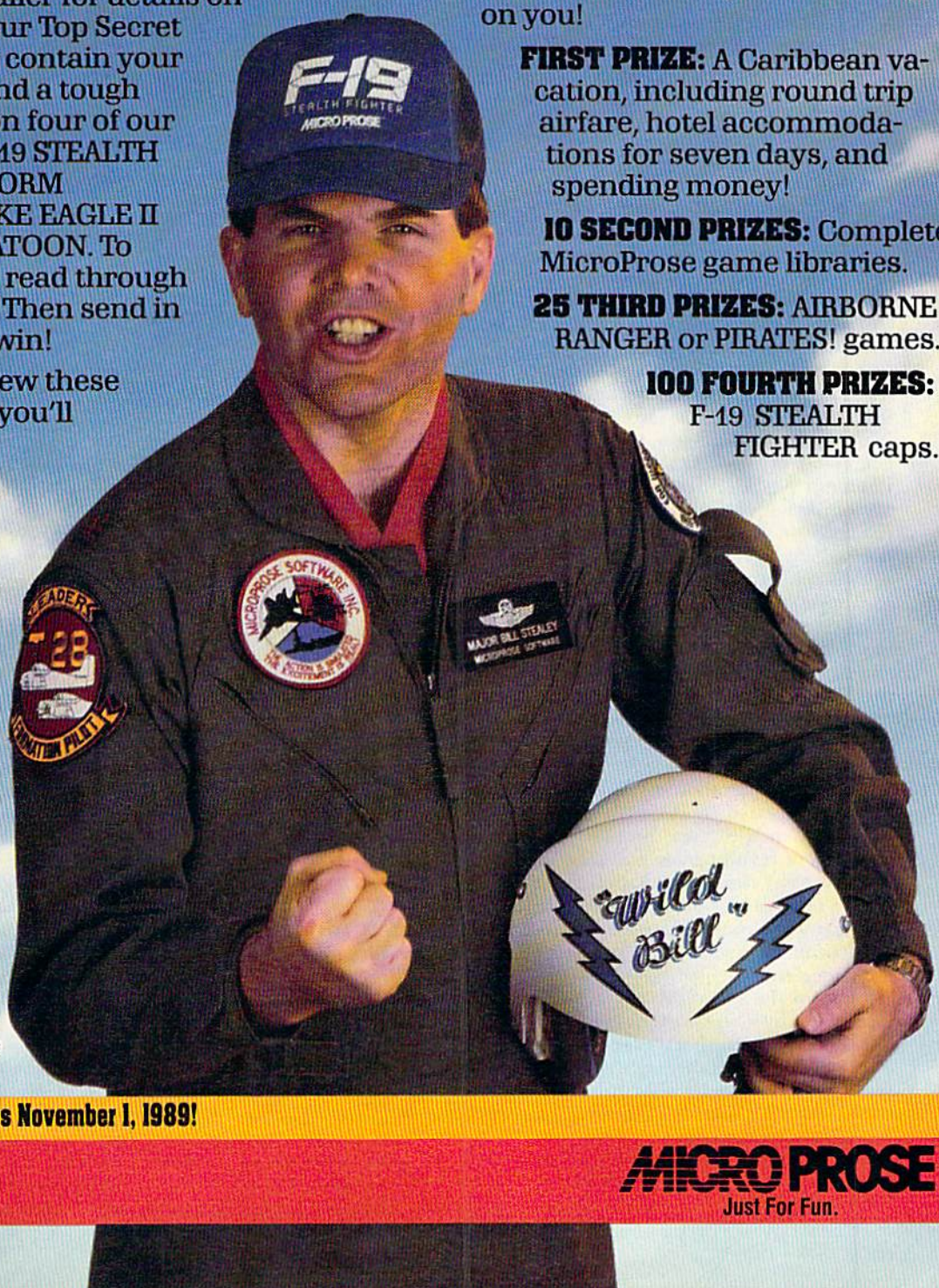
You'll get to preview these four games, plus you'll have the chance to win a fabulous Caribbean vacation, or one of 135 other awesome prizes! So enter now. The Major is counting on you!

FIRST PRIZE: A Caribbean vacation, including round trip airfare, hotel accommodations for seven days, and spending money!

10 SECOND PRIZES: Complete MicroProse game libraries.

25 THIRD PRIZES: AIRBORNE RANGER or PIRATES! games.

100 FOURTH PRIZES: F-19 STEALTH FIGHTER caps.



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Get Ready! Contest Starts November 1, 1989!

MICROPROSE™
Just For Fun.

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Circle 68 on Reader Service card.

cept this rationale, the puzzles themselves are interesting, challenging and fun. They are all variations of classical brain-teasers that have been around for hundreds of years, and they are not easy at first encounter. Once you've solved them a few times, of course, you recall their secrets, but the initial trials are engrossing.

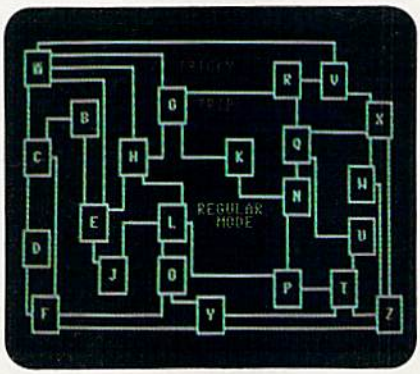
Ten puzzles, presented on two disks, are chosen from main menus, and then, when the individual game menus appear, you can choose Instructions, Regular mode or Contest mode. There is some computer interaction in Regular mode, where the program asks if you want a hint when it detects that you're going off in a wrong direction, but in Contest mode you're on your own. Instructions are clear, and you work through the puzzles by using easily learned keystrokes. Patience on your part is, however, an advantage, not only in seeking solutions, but during some long waits while the program sets up and when it goes to excessive lengths in congratulating your successes. But this is a minor quibble.

Perhaps the easiest game is Electro-Connection, in which you have to draw non-intersecting lines connecting similarly lettered boxes. The second puzzle, Number Hop, displays a 12×20 grid composed of the digits 1 through 4, randomly placed. After a flashing cursor on one square starts you off, the challenge in Regular mode is to hop horizontally or vertically the number of squares indicated by the digit of the square you're on until you've made 100 hops. Contest mode gets harder by giving you successive goals of 2, 4, 8, 16 and 32 hops, but adding the condition that the *average* of the squares you hop to must always remain greater than 3 (with the start always on a 4).

Another good challenge is taking a journey on a map showing 23 lettered "cities" connected by various "roads." The problem is to pass through each city without revisiting any and without traversing any road a second time. This Tricky Trip, as it's called, is great until you learn the route; there's only one configuration, so subsequent trips hold little interest.

Some of the other puzzles involve: identifying, by successive weighings, the one coin out of nine that is either lighter or heavier than the other eight; moving seven different-sized dishes from one stack to another without ever placing a larger one on a smaller (the ancient Towers of Hanoi puzzle); pouring water back and forth among three beakers of different volume to achieve equal amounts in two of them; and a variation on the old poser of the farmer getting three animals across a river one at a time without ever leaving alone a pair of natural enemies, one of which would devour the other.

Although Comp-U-Solve's clear and comprehensive documentation, which, by the way, includes explanations and solutions, recommends ranges of grade levels (from 2 to 12) appropriate to the difficulty of the various puzzles, I have a problem believing that many children under age nine or ten would have the interest and perseverence, let alone ability, to get far with them. I think the games are fine for upper elementary grades and above, and certainly many adults can have fun with them. I did.



Challenge yourself or your students with this Comp-U-Solve puzzle, Tricky Trip.

This well-conceived and well-executed program serves a worthwhile purpose and entertains you in the bargain. *(Educational Activities, Inc., Freeport, NY 11520. C-64/$109 for both disks, with a total of ten games; $59.95 for one disk of five games.)*

—SWAIN PRATT
RUN STAFF

ROCKY'S BOOTS ..... A

These Boots Were Made for Learning

Rocky's Boots, originally copyrighted in 1985, has earned a reputation as an educational classic, but it deserves to be more widely known in the Commodore community. In the first place, the object of the game is to teach problem-solving skills by using the logical tools employed in both programming and electronic circuit design. In other words, Rocky's Boots is really about computers. Secondly, it's pure fun from the opening of the first on-screen tutorial. Finally, Rocky's Boots demonstrates what exciting results imaginative C-64 programming can achieve without resorting to technical razzle-dazzle.

Rocky's world consists of a series of interconnected rooms. In the tutorials, you move from room to room, encountering a collection of electronic machine parts and the wires that are used to join them. There are no spectacular graphics or sound effects here. Everything is uncompromisingly two-dimensional, but, remarkably, all the electronic parts are functional. You can put them together, turn them on, watch the electricity flow and see the machine that you've constructed start to work. . .or not work. If you've got a glitch, you simply grab your splitter, pull out the offending section and rebuild as much as necessary. It's up to you to play around, try things out and observe what happens.

Sometimes, there are surprises—my first experimental machine ran away from me. (I'd sort of hoped it would work that way, but I didn't trust the software to play fair; it does, though!) After a while, I found myself behaving as if I were working in the real world, trotting back and forth between rooms looking for the splitter and cannibalizing the demonstration machines for interesting parts to use in my own constructions. I felt that I'd finally been given the Erector Set I'd always wanted as a child.

Once familiar with the available parts, you can move on to the games: first Rocky's Boots and then Rocky's Challenge, which has complicated pieces and more difficult puzzles. Your job is to build a kicking machine that will select specific targets and boot them as they pass by. If you have trouble designing a machine to do the job, the excellent manual provides some solutions (but try not to peek!). The games have a Debugging mode that runs your machine in slow motion, so you can spot mistakes and correct them.

There are no penalties for failures and no high scores to encourage competition. However, Rocky himself comes out to help you celebrate when you've built a successful machine. It's surprisingly nice to watch someone else hop up and down when you think you've been particularly clever.

When you've solved all of Rocky's puzzles, you can create your own brain-teasers. And, when you're finally ready to put the disk away, you may find that the fun has just begun. If you're not all thumbs, you might experience an irresistible urge to grab a soldering iron and continue the game outside of the ►

BAD TO THE BONE

These are the streets. And there are no rules when you do battle here.

STREETFIGHTER is strictly survival of the fittest against 8 of the baddest dudes from around the world. Watch out for flying scissor kicks, lethal Ninja weapons, and other evil tricks. Block their attacks while you counter with jabs and roundhouse kicks. Don't drop your guard cause these guys aren't just b-b-b-b-bad. They're "Bad to the Bone."

So see your favorite software retailer or call Capcom U.S.A. 408-727-1665. You don't want to keep these guys waiting!

Try a roundhouse kick against an English street tough.

Dodge the lethal Ninja weapons of Geki.

CAPCOM® USA

Circle 22 on Reader Service card.

computer environment, or if programming is your hobby, you may find you've developed new skills to use there as well.

The Learning Company recommends the program for ages nine and up. Judging from my own experience, that age range should extend way, way up. I think Rocky's Boots deserves a place in your library whether or not there are children around to share it. *(The Learning Company, 6493 Kaiser Drive, Fremont, CA 94555. C-64/$49.95.)*

—BARBARA MINTZ
LEXINGTON, MA

GERTRUDE'S SECRETS ..... A–

Classifying Colors and Sorting Shapes Increase Your Child's Problem-Solving Skills

Ducky! That's how to describe Gertrude's Secrets, a captivating C-64 educational game from The Learning Company. Hosted by a feathered barnyard friend (who's actually a goose), it's designed to teach four- to seven-year-olds to recognize similarities and differences and to use deductive reasoning—both important skills for reading and math. The game is clever, clearly presented, colorful and entertaining, and it provides room for a child's initiative.

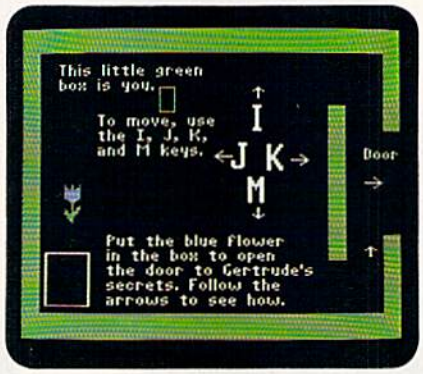
The basic design of Gertrude's Secrets can be likened to an adventure game: You move a large cursor from room to room to get instructions, view sample puzzle solutions and then solve the randomly generated puzzles. Children in the targeted prereading group will need help getting started, since instructions both in the manual and on-screen must be read. However, after the first time through, the typical child can probably go it alone. Simple direction signs at many doors may even get the child reading. The program runs without any glitches, and it doesn't need to access the disk after loading.

At the first screen, you can go directly through the secret door into the game area, or you can choose to go through the general-instruction rooms. In these rooms, you learn to move the cursor using the keyboard or a joystick, to make the cursor go fast or slow, to pick up and drop puzzle pieces and to toggle the occasional sound sequences off and on.

The first screen opens the door to Gertrude's Secrets. Just inside is her room, where she rests when not busy and where other doors lead to three puzzle areas: arrays, trains and loops.

Each type of puzzle calls for identifying similar pieces and deducing a rule for arranging them. The two array puzzles—3×3 and 4×4—are solved by placing similarly shaped or colored pieces (sets) in each row or column.

The three train puzzles consist of six rectangles strung together. In the first puzzle, the pieces placed in successive rectangles must be different in one respect, either in shape *or* in color; in the second, they must differ in both shape


This little green box is you.
To move, use the I, J, K, and M keys.
I
J K
M
Door
Put the blue flower in the box to open the door to Gertrude's secrets. Follow the arrows to see how.

In Gertrude's Secrets, your child can use a joystick or the keyboard to move between rooms and puzzles.

and color; and in the third, they must have one or two differences, depending on whether the connecting lines are single or double.

The first loop puzzle is a large rectangle to be filled with either a color or shape set. The second consists of two overlapping rectangles (a Venn diagram), each to be filled with a different set. If one loop gets colors and the other shapes, any pieces having the same attributes go into the overlap area.

A correctly placed piece stays in a puzzle. If it's incorrectly placed, it drops down out of the puzzle, and you can pick it up to try again.

By completing a puzzle you earn a treasure, which Gertrude stores in the Treasure Room. You can visit there any time you want to see how many goodies you have. Unfortunately, some of the treasures are too small to make out what they are.

Although neither the program nor the manual makes it clear, you can abandon a puzzle at any time by finding Gertrude in her nest and picking her up. You can also see a list of the program-control keys by pressing the ? key. Inappropriately for prereaders, however, the list is mostly in prose.

The puzzle pieces come from the Storeroom. If you take a break from solving a puzzle to look there, you see that, sure enough, the pieces you're using are gone. Next to the Storeroom is the New Puzzle Piece room, where you can obtain alternate sets of pieces. An especially nice feature of the program is the Shape Edit room, which lets you alter the built-in pieces to your heart's content.

Even as a card-carrying adult, I had fun wandering through the maze of rooms, experimenting with the program. Trying to work out and remember the configuration of the maze was an interesting exercise, too. The manual does include a map of Gertrude's world, but I'd suggest you not look until you've figured it out for yourself.

The writers of Gertrude's manual have done well in producing text an adult can read to a child and both will understand and enjoy. Screen shots help refresh your memory regarding rooms other than the one you're in. The manual also provides lists of the skills taught by each puzzle, summaries of the keyboard and joystick controls, a small glossary of program-related concepts, schemes for playing Gertrude's Secrets in noncomputer settings, the map and a list of hardware requirements.

Curiously, the latter doesn't include the Commodore, although program controls for the Commodore are specified elsewhere. However, the program worked fine on my C-128, 1571, 1701 system, and my C-64 and 1541 with a third-party color monitor.

I would recommend Gertrude's Secrets as a learning tool for young children. For those of us who are older. . . well, I suppose buying it doesn't make sense, but it certainly is fun! *(The Learning Company, 6493 Kaiser Drive, Fremont, CA 94555. C-64/$29.95.)*

—PEG LEPAGE
RUN STAFF

LETTER-GO-ROUND ..... A

Round and Round The Ferris Wheel Goes. . .

As incredible as it seems, more than 20 years have passed since the Sesame Street television show began its mission of teaching and entertaining children. One of the TV program's offshoots is a software series that has brought the show's successful educational formula to the C-64. A fine example of these programs is Hi Tech Expression's Sesame Street Letter-Go-Round.

This program teaches simple spelling, word formations and letter recognition and matching to an intended audience of children from three to six. ►

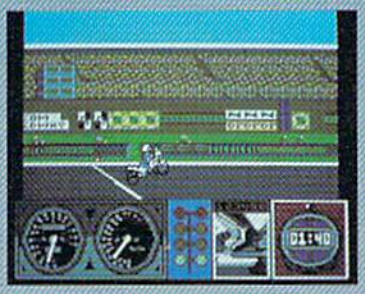
SANTA CLAUS IS COMING TO TOWN

Better watch out!

After a test ride on Pocket Rockets, the high-speed motorcycle simulation game, Santa picked up a new sleigh that will make this year's rounds faster than ever. And whether you've been naughty or nice, you could win this Suzuki 600 Katana during "Santa's Sleigh Giveaway" in January.

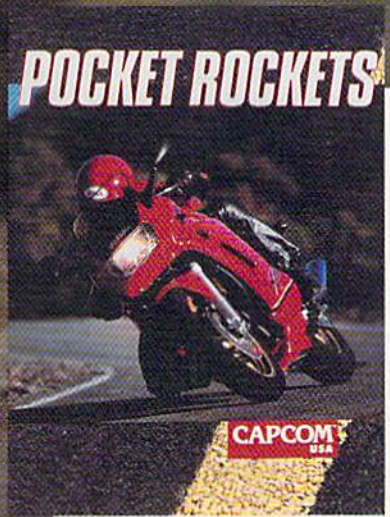
Meanwhile, experience all the thrills and spills of high-speed racing with machines that take you from zero to 60 in under four seconds. Already gaining critical acclaim, Pocket Rockets lets you choose from four of the quickest, most exotic bikes on the planet. The action's as real as the adrenaline you'll feel.

Then, enter "Santa's Sleigh Giveaway" from Capcom U.S.A. Besides the chance to win a new Suzuki motorcycle, you could get a Bell full coverage helmet, or Capcom computer game software. Look to enter in all Capcom computer game packages or visit your favorite computer game retailer for more information. Capcom's belated Christmas giveaway is just around the bend so don't miss out on your chance to win!



LEFT: Try your skill against the clock with a couple of laps around the test track. RIGHT: Drag racing demands a quick wrist and fast shifting. Just don't blow the engine!

Circle 19 on Reader Service card.



SWEEPSTAKES RULES How to Enter:

1. NO PURCHASE NECESSARY. Fill out and mail official entry found in package or you can enter by hand printing your name, address and zip code on a 3" x 5" piece of paper and mailing it to CAPCOM Santa's Sleigh Giveaway, 3303 Scott Blvd., Santa Clara, CA 95054. Enter as often as you wish. Each entry must be mailed separately by JANUARY 15, 1990. No mechanical reproductions of entry will be accepted and all mail-in entries must be received at the above address by JANUARY 31, 1990. No responsibility is assumed for lost, late, misdirected, or damaged entries.

2. Prize winners will be determined by means of a random drawing to be conducted by an independent judging organization whose decision shall be final. All prizes listed will be awarded, but there can be only one prize winner per household, group or organization. Odds of winning depend on the number of entries received. Approximate grand prize retail value is as follows: Suzuki Katana $4,495.00. Winners will be notified by mail by FEBRUARY 15, 1990 and may be required to execute affidavits and advertising release. Taxes on prize winnings are solely the responsibility of the winners.

3. Sweepstakes is open to U.S. residents except employees of CAPCOM U.S.A. and their immediate families, its subsidiaries and affiliates, its advertising and promotional agencies, and the judging firm. Prizes won by minors may be awarded to parent or legal guardian. Void where prohibited or restricted by law. All Federal, State and Local regulations apply. For a list of major prize winners send a stamped, self-addressed envelope to CAPCOM Santa's Sleigh Giveaway Winners List, 3303 Scott Blvd., Santa Clara, CA 95054 by MARCH 31, 1990.

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It contains six types of games. The first three vary according to a game's length and whether upper- or lowercase letters are displayed. In each, play begins with a Muppet bringing a letter to the screen. The child then uses a function key to pick a matching character when it reaches the bottom of a spinning ferris wheel.

The fourth game is called One Little Word. Its goal is to choose the letters on the wheel that duplicate those in a word. In What's Missing, a child tries to find a character that correctly completes a word. The last type of game has a youngster attempt to discover the three letters that make up a secret word.

In all six games, a correct choice causes the selected letter to fly into the air and become part of a tower. At the end of each game, the last letter hits a bell in the completed tower as Big Bird, Cookie Monster and Bert perform a lively little dance.

My only criticism of the program involves its documentation. Although the instructions indicate otherwise, the ferris wheel's speed cannot be reduced below its default setting; however, few members of the software's intended audience would have problems with the wheel's speed during the game.

More than making up for the manual's shortcomings are the program's positive elements. The graphics, for instance, are rich and appealing, and the sound effects are excellent. And, best of all, the program's carefully crafted design guarantees many enjoyable hours of practice in important early reading skills.

While software packages that are inspired by television often turn out to be disappointments, this is definitely not the case with Letter-Go-Round. This low-priced computer program is every bit as good as the illustrious broadcast series, now in its third decade, that it was derived from. *(Hi Tech Expressions, 584 Broadway, New York, NY 10012. C-64/$9.95.)*

—WALT LATOCHA
OAK PARK, IL

COLONIAL TIMES DATABASES . . A–

Jump Into This Time Capsule For an Educational Trip To Colonial America

Picture a time when blacksmiths pulled teeth, children played with corn husk dolls, and teeth were cleaned with honey and pulverized charcoal. By engaging in activities that use Colonial Times Databases, a set of files designed for use with Bank Street Beginner's Filer and Bank Street School Filer, students can get a feel for the history and day-to-day life of colonial America.

The software's stated goal is to help history "come alive" for students in elementary and junior high school, by providing them with historical, social and personal information about colonial times. Students develop research and analytic skills as they learn to manipulate the database. The files include travelog information (demographics and history), colonial news, patriot biographies, job descriptions, recipes and game instructions, family life facts and a glossary that contains information about the vocabulary used within each of the files.

If students are not acquainted with the Bank Street programs or with how to use a database, the teacher will have to spend some time familiarizing them with the procedures for accessing and manipulating the databases.

The Teacher's Guide contains an overview of the material in each file. This includes a rationale, descriptions of fields and a bibliography. Novice and advanced activities, including reproducible student worksheets and answer keys, are provided as well.

For the most part, the activities seem clever, workable and worthwhile; they should not only engage the student in a productive database search, but should provide accurate and interesting information. For example, students are asked to simulate an advertising campaign on behalf of a particular colony; to do this, they must discover what aspect of the colony is unique. Other activities involve creating timelines, comparing colonies through the use of a Venn diagram, creating want ads for colonial occupations and engaging in historically accurate game-playing.

There are some limitations to a database like this. It isn't always clear that the screen must be scrolled to the right to get a complete entry. Also, the glossary should include pronunciations. And some of the entries could be more complete. For example, picture the student who finds, to his or her great delight, the entry on the game "bilbo catcher." There is no help in the entry or the glossary for the teacher when the child asks why the game is called that. (A bilbo, according to the Oxford English Dictionary, could be either a slender sword or a long iron bar that fettered a prisoner's feet.)

The Resource Section could be expanded as well. Some of the drawings could be replaced or supported by photographs. In addition, a list of appropriate historical fiction, as well as a listing of historical exhibits throughout the country, would be a boon to teachers.

But these are mostly sins of omission. Although a database like this is no replacement for a library, it doesn't really pretend to be. It is an exceptional tool for helping children become computer literate, and it should provide any elementary or junior high classroom with plenty of information for a fascinating trip back in time. *(Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570. C-64/$59; lab pack $177.)*

—SHARON G. WEINER
CHICAGO, IL

THE INCREDIBLE LABORATORY . . . . . B+

Bubble, Bubble, Toil. . . And Learn!

The last decade has seen a new and exciting focus on critical thinking skills in the schools. Far too few textbooks or software products effectively address these important skills. The Incredible Laboratory is one of the exceptions. It helps children develop a few specific problem-solving skills in an engaging, entertaining context.

The Incredible Laboratory is a logic game appropriate for grades 3 and up. In addition to fostering note-taking habits, it develops analytic skills that are called, in the accompanying teacher's guide, "successive scanning" or "trial and error." The user must develop strategies for identifying which chemical causes what effect in the creation of a monster. Young children will quickly figure out that they must jot down notes in order to remember what mixtures cause what effects.

There are three ability levels—novice, apprentice and scientist—each with two modes. In Play mode, the user chooses chemicals to produce a monster, and then through a process of trial and error, deduces which chemical produced which body part. The levels are successively more difficult, with more chemicals to add to the mixture, and with chemicals that combine to result in new effects. At the more advanced scientist level, the chemicals produce different monster parts each time the program is run. In Challenge mode, two players collaborate in choosing chemicals to concoct a monster; both players then identify which of three ►

ANOTHER ONE BITES THE DUST

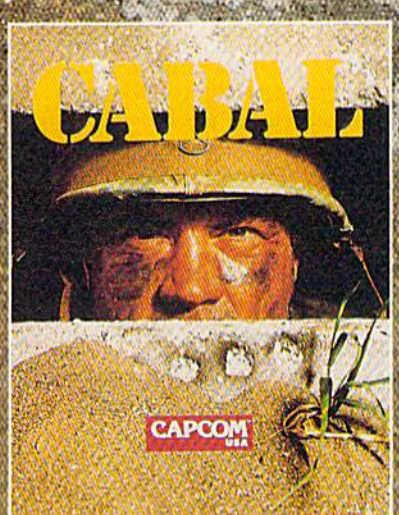
Eliminating terrorists.

Easier said than done. You must destroy these soldiers of fortune who strike you with machine guns, tanks, grenades and worse. Only then can you celebrate your victories.

Go beyond traditional war games and see why CABAL is #1 in the arcades. The fast action of every covert operation keeps you at the edge of survival.

See your favorite software retailer to enlist in the excitement. Or for more details, call Capcom U.S.A. at 408-727-1665 Act fast so that "another one" is one of them.

Cabal Screen Shots.

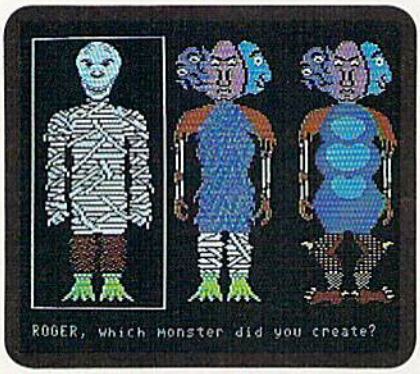


CAPCOM® USA

Circle 35 on Reader Service card

monsters displayed on the screen is the monster they created.

The Challenge mode lets students brainstorm and cooperate, both excellent strategies for problem solving. The on-screen instructions for this mode are confusing, however. It's not clear from the prompts that it's meant for two players to cooperatively create the monster. Further, there will be times when a player wants to challenge him- or herself, which can be done, but only by typing in two names (or one name twice). And, unfortunately, in either mode, once a chemical is selected, there's no turning back.



Monsters and mummies and whatevers, oh my! Create them all in The Incredible Laboratory.

The Incredible Laboratory has clever graphics: a beaker containing the chemicals heats up, the chemicals vaporize and the monster appears in a connected container. The monster parts themselves are amusing, ranging from three very silly connected heads to cowboy boots. The sound effects are especially wonderful when, in Challenge mode, the imposter monsters dissolve with a slurpy, relatively realistic sound.

The teacher's guide, presented in a looseleaf binder, includes directions and worksheets. It also comes with classroom lessons on note taking and trial-and-error procedure. Most of the suggestions will be helpful to classroom teachers. The note-taking lesson, however, is based on identifying the main ideas and supporting details of a Paul Bunyan story; it's quite a jump from this to the type of note taking required for a chemistry experiment. An activity clearly based on scientific method might more effectively help children learn strategies necessary for a successful experiment in The Incredible Laboratory.

The lack of sufficient classroom materials could affect some teachers' success with this program. Suggestions for integrating the program within a curriculum—including activities to precede and follow its use within various subject areas—would also help a school district justify both the use and the cost of the program. Teachers would also be well served by a discussion of additional strategies that children can use with this program.

The Incredible Laboratory could be a delightful addition to any school (or home) software library. The strategies it fosters should help students in areas throughout the curriculum, from language arts to science and math. This is a genuinely challenging program that's both educational and fun. After all, what self-respecting kid is able to resist experimenting with a bit of alien oil, bubbling mud or fuzzy mold? *(Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570. C-64/$65; 10-disk lab pack $195.)*

—SHARON G. WEINER
CHICAGO, IL

FRACTIONS: AN INTRODUCTION . . B
MATH FOOTBALL: PERCENT . . . B+

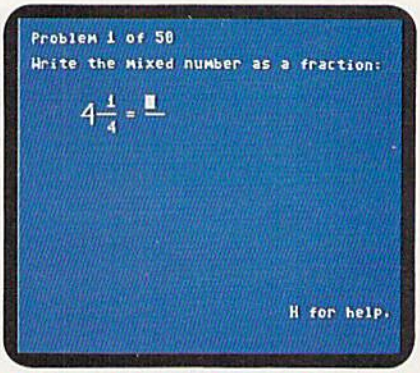
Correct Answers Get You Into a Mountain Or the Endzone

As many adults can testify from their own experience, learning fractions—both common and decimal—and the mysteries of percentage is often an excruciating process for children in the middle elementary school grades. With a thorough introduction, however, followed by consistent practice, the painful struggle can give way to the satisfaction of success. Fun can even ensue, if the practice is motivated by programs like Fractions: An Introduction and Math Football: Percent, both of which contain game aspects.

The title of the Fractions package is a bit misleading, for it's by no means an introduction. It does, however, provide a wealth of practice—with fairly simple examples that many children could do in their heads—on basic operations in transforming common fractions.

Three lessons are offered, each with several levels of complexity. The first deals with simplifying by reducing to lowest terms and changing improper fractions to mixed numbers; the second with finding lowest common denominators; and the third with the processes of expansion, or the reverse of simplification.

The formats and on-screen instructions are generally clear, and the examples change upon replaying the levels, so there is little repetition. One drawback—easily repairable, I should think—is that you cannot, at will, abandon the level you're in to return or advance to another lesson or level. If you want to escape, your only recourse is to press F1, which puts you back at the beginning of the whole program. This is not mentioned in the on-screen directions, and only obscurely in the otherwise adequate documentation.



Fractions: An Introduction provides practice with finding lowest common denominators and all sorts of transformations.

Two sections of teacher management are available: one for viewing, printing or deleting records of students' scores, which the program keeps, and the other for altering the number of problems in a level run, the percent of correct answers you need to play the reward game, time limits, and so on.

The reward game, which didn't grip me, but would, I suppose, appeal to younger children, is Magic Mountain, wherein you climb ladders, avoiding trap doors and bats, to escape through a door at the top. You earn a chance to play it by getting a certain percentage of problems correct in a given level (the default values are eight out of ten). I found it hard to make the little man do what I wanted, and twice during game play the computer froze up on me, so I shunned the pleasure thereafter.

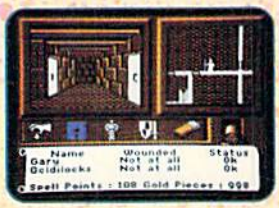
The Fractions program surely provides suitable practice for fifth or sixth grade children and would be good remedial review for older students, but it does assume that basic instruction has been given, including, for example, the meaning of "greatest common factor." But, of course, anyone past sixth grade knows what *that* means.

The game aspect in Math Football: Percent is of an entirely different order. You play a football game throughout, solving problems to take your own team downfield or to defend against the ad-

Continued on p. 60.

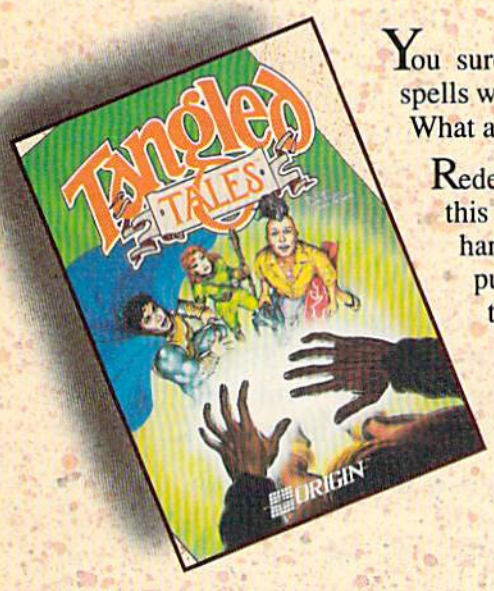
Tangled TALES™

Myth, Magic and Mirth



Screens shown are for Apple II.

What do a "tubed-out" California surfer, a knight in shining armor and a Shakespeare-spouting elf maiden have in common? Typically nothing! But you'll recruit this off-beat crew and meet more than 50 other peculiar characters in TANGLED TALES, the Misadventures of a Wizard's Apprentice.



You sure aren't the wizard's star pupil. In fact, he took away your spells when you spilled his precious adamantite dust on the squirrel. What a mess that turned out to be!

Redeem yourself, fill your spell book and save Violet Valley on this fractured journey where time stands still — or maybe just hangs around. It's filled with stirring combat and perplexing puzzles, and features dazzling graphics with animated illustrations, 3-D dungeons and detailed overhead views.

You've seen fantasy, role-playing and graphic adventure games before, but never one that combines myth, magic and mirth like TANGLED TALES.

ORIGIN™

136-B Harvey Rd., Londonderry, NH 03053

Available for: Apple II series, Commodore 64/128. Not available at your local retailer? Call 1-800-999-4939 (8am to 5pm EST) for Visa/MC orders; or mail check/money order (U.S. $) to Origin. All versions $29.95, plus $2.50 shipping and handling. Allow 1-2 weeks for delivery.

The Entertainer

Once again, CES shows the Commodore 64 to be the premiere game machine.

When you think of Chicago, you might imagine the Cubs, all-night blues clubs or some of the greatest restaurants in the country. However, each June Chicago is also the place to go for a glimpse of the hot new software titles that will appear on store shelves in the fall. The event is the International Consumer Electronics Show (CES), and if you can find your way past all the CD players, VCRs, fax machines and cellular car phones, it offers a rare opportunity to see what leading software publishers have in the works.

In partial contradiction to all the current reports (self-fulfilling prophesies?) that the C-64 market is dying and that most software publishers are shifting toward the MS-DOS environment, I was happy to find several companies still vigorously supporting the 64 with dozens of new sports simulations, war games, graphics adventures, role-playing games and action-packed arcade games. However, those of you who were hoping for a C-64 version of Lotus 1,2,3 or some serious project-management soft- ►

By BOB GUERRA

ILLUSTRATED BY DAVID TILLINGHAST

C-64

Kings of the Beach: Professional Beach Volleyball —Electronic Arts—

RIVERWIND
An outcast of the Que-Shu tribe, he had the temerity to fall in love with Goldmoon. With the skills of a Human Ranger, he fights with bow and sword. With his betrothed, he is seeking the secrets of the Blue Crystal Staff.

Heroes of the Lance —SSI—

Curse of the Azure Bonds —SSI—

Snow Strike —Epyx—

ware for your C-128 will have to wait until next year—at this CES, the focus was definitely on fun.

Accent on Sports

As in previous years, software publishers are busy bringing the thrill of victory and the agony of defeat home to your computer screen with sports simulations based on everything from grand prix motorcycle racing to soccer. Some of the simulations you can expect to see this fall include a pair of motorcycle racing games, The Cycles, from Accolade, and Super Hang On, from Data East.

Data East has also announced a new line of sports simulations, called MVP Sports, which will kick off this fall with ABC Monday Night Football. Other additions that Data East plans for the MVP line-up include basketball, baseball and auto racing. All games in the line will have a similar user interface and feature graphics that let you see the action from the player's perspective.

You'll also have a chance to occupy the driver's seat in Electronic Arts' Ferrari Formula One, or, for action that's hot but not quite as fast, to smack some volleyballs over the net in EA's Kings of the Beach: Professional Beach Volleyball.

Mastertronic is set to release four new sports simulations that, like John Elway's Quarterback, are endorsed by major figures. The titles to look for are Orel Hershiser's Strike Zone, Rick Davis's World Trophy Soccer, Greg Norman's Ultimate Golf and Magic Johnson's Basketball. In the same vein, Electronic Arts will release John Madden's Football, for all you armchair coaches who think you can make it to the Super Bowl. Another upcoming roundball game is Omni-Play Basketball, from SportTime, which will let you develop and coach your own teams and compete against 22 others. To enhance your game, you can also purchase additional "modules," such as Pro League or College League.

Epyx, the company that brought you Summer, Winter, World and California Games, has gone way out this time to come up with an athletic event that's out of this world. The game, called Purple Saturn Day, pits seven space aliens and an earthling against each other in four events: Ring Pursuit, Brain Bowler, Tronic Slider and Time Jump.

On the other hand, if you prefer your sports a little more down to earth, keep an eye out for Medalist International's 3-D Pool, which should be available by the time you read this, and Oriental Games, scheduled for release in September.

Adventure/Role-Playing

Players looking for new dungeons to conquer will have plenty to choose from this fall, as several new fantasy/role-playing games hit the market. For example, Strategic Simulations will finally release Heroes of the Lance for the C-64, along with the long-awaited sequel to Pool of Radiance, called Curse of the Azure Bonds. SSI's Linda Blanchard assured me that Curse of the Azure Bonds won't be plagued by the inescapable 20-minute combat sessions that have frustrated Pool of Radiance players. SSI is also planning to release Dungeon Master's Assistant, Vol. II: Characters and Treasure, and they have clue books available for both Hillsfar and Heroes of the Lance.

If you've already fought your way through Bard's Tales I, II and III, you'll be glad to know you don't have to send your characters to the "retired adventurers" home just yet. Instead, you can transfer them to a new Interplay role-playing game called Dragon Wars. It features high-quality animated graphics, an extensive combat system, automapping and a convenient player interface with pop-up menus.

Perhaps the most exciting new role-playing game an-

nounced at CES was Origin's Knights of Legend, actually a master system plus the first of five modular games that create an immense role-playing world. This first installment, called The Realm of Ashtalarea, features more than 30 towns, hundreds of characters, excellent graphics animation and a combat system that lets you customize your characters' weapons and armor.

Origin will also release a sequel to Moebius called Windwalker. Like Moebius, this role-playing game is set in the Orient and features animated martial arts combat sequences. The third Origin role-playing adventure to appear this fall will be Space Rogue, a unique game that combines a sophisticated space-flight simulator along with traditional role-playing elements.

Players who enjoyed Epyx's Space Station Oblivion now can get two more 3-D graphics adventures that use the same Freescape system of graphics modeling. These two games, Dark Side and Total Eclipse, from Spotlight Software, allow you to maneuver freely through three-dimensional worlds as you search for treasure and solve logic puzzles. The setting for Total Eclipse is a vast Egyptian pyramid, and Dark Side takes place in a futuristic military outpost.

Finally, for everyone who believes the best time to watch television is Saturday morning, Microillusions will release new graphics adventures based on Scooby Doo, The Flintstones and Johnny Quest. All these games feature story lines and graphics that are true to the originals, as well as arcade sequences that get you really involved in the action.

War Games

War-gamers will see plenty of front-line action this fall, starting with Empire from Interstel, which puts you in command of invasion forces during a full-scale planetary war. You begin with control of a single city, and then must manage your troops and resources to gradually take over the world. Another strategic-level war game that armchair generals can look forward to is SSI's Storm Across Europe. Set during World War II, it lets you control several facets of the conflict, from naval attacks on enemy shipping to strategic bombing of production centers.

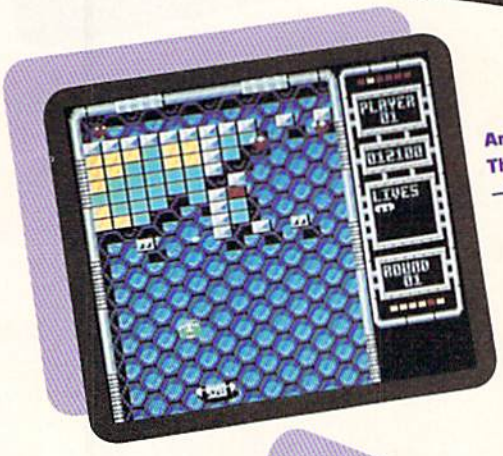
You'll be able to engage in head-to-head tank combat, too, with Microillusions' Fire Power, a "capture-the-flag" game featuring smoothly scrolling battlefields and your choice of three tanks. If you'd rather create your own armed conflicts, sign up for the Universal Military Simulator II, which should be available from Medalist International by the end of October. This simulation lets you build battles from the map up, using a variety of terrain types and weapons. Medalist will also release a naval simulation called Carrier Command.

There will be a couple of "striking" new aerial combat games to choose from this fall: Apache Strike, from Activision, and Snow Strike, from Epyx. Apache Strike puts you in control of an AH-64 Apache attack helicopter on a seek-and-destroy mission to knock out computers that control enemy nuclear arsenals. Snow Strike places you in the cockpit of an F-14 jet fighter, where your mission is to destroy targets involved in the production and transport of illegal drugs in South America.

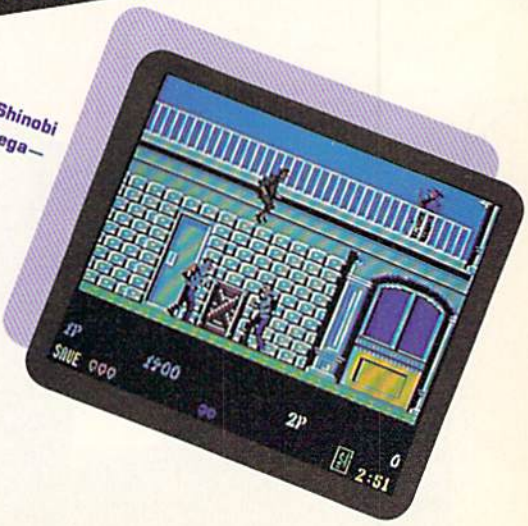
One of the most intriguing new military simulations shown at the June CES was a cybertank construction kit called Omega, from Origin. Here, instead of controlling a tank that's already built, you build your own by selecting from ten chassis types and drive systems, plus a variety of weapons, scanners and special items. Because cybertanks fight on their own, you must also create the artificial intelligence that will govern your tank's actions. This is done either by choosing ►

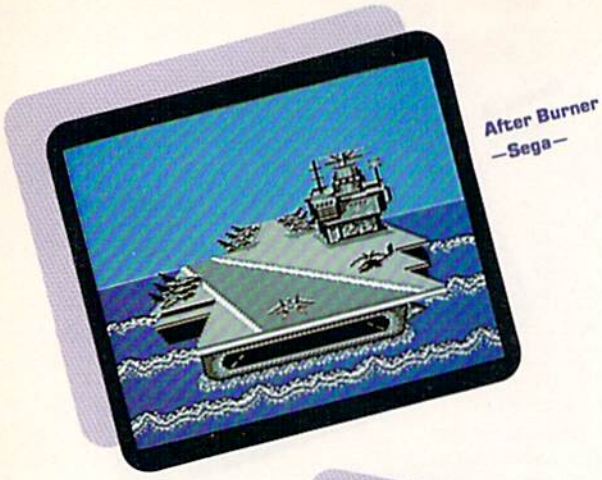
Rambo III
—Taito—

Licence to Kill
—Broderbund—



Arkanoid II:
The Revenge of Doh
—Taito—


Shinobi
—Sega—



After Burner
—Sega—

Netherworld
—Medalist—

predesigned capsule routines from pull-down menus or by using the built-in, English-based, Cybertank Command Language. Omega is especially exciting because cybertanks created on a C-64 can battle against those created with any other version of the program. This feature is significant, since cybertank files can be up- and downloaded through electronic bulletin boards.

A similar game, Combots from Avalon Hill, will let you build heavily armored combat robots that can jump, swim, walk or fly around the battlefield. Each Combot is between 12 and 300 feet tall and manned by a pilot plus up to six crew members. The game comes with eight scenarios, in which you can play against a friend, against the computer, or with a friend against the computer.

SEQUELITIS

If you went to the movies at all this past summer, there's a good chance you saw a sequel to a film that had already proven itself a winner at the box office. There was *Indiana Jones and the Last Crusade, Ghostbusters II, Karate Kid III, Lethal Weapon 2* and several others. Well, like Hollywood, the entertainment software industry understands that people are often more likely to spend money on something familiar than on a product that's new to them. Thus, many of the new arcade games announced at CES are either sequels to previous software hits or adaptations of popular movies, comic books or coin-operated arcade games.

Taito, for instance, announced Rambo III, an action game that follows the plot of the movie. In the computer version, your mission is to singlehandedly defeat the Soviet Army in Afghanistan and free Colonel Trautman from a heavily guarded fortress.

Activision will turn the summer blockbuster *Ghostbusters II* into a computer game late this fall. Some of the Ghostbusting activities that fans of both the movie and the original computer game can look forward to include driving the Ectomobile through New York, sampling the river of slime flowing beneath the city, and, of course, blasting plenty of ghosts and slimers.

Another summer movie that's being translated into a computer game is *Indiana Jones and the Last Crusade*. This Lucasfilm title features several action sequences familiar to anyone who has seen the movie. To win, you must fight your way through the moving circus train, make it past the rat-infested catacombs of Venice, and survive the three trials of the Grail Temple to reach the Holy Grail itself.

The most recent movie to turn up as a computer game for the C-64 is James Bond's *Licence to Kill*. The game, a British import from Domark that will be marketed in the U.S. by Broderbund, places you in the role of Bond on a mission to defeat a powerful drug lord. As 007, you pilot planes and helicopters, swim in shark-infested waters and shoot it out with the enemy.

PLEASE INSERT COIN

Some of the action-packed arcade sequels that will give your joystick a workout this fall include Mastertronics' Double Dragon II, Mindscape's Gauntlet II and Taito's Arkanoid II: The Revenge of Doh. In addition, Defender, a classic coin-op from the past, will become available from Epyx. Revenge of Defender, as the new program is called, is an enhanced version of the original horizontally scrolling space shoot-'em-up and features seven strange new worlds to defend.

Mindscape, meanwhile, is scheduled to release C-64 versions of two recent arcade hits, Sega's Shinobi and After Burner. Shinobi sends you on a hostage rescue mission,

where you must use martial arts and magic to defeat thugs, mongos, ninja leaders and, would you believe it, an evil helicopter. After Burner is yet another F-14 jet combat game in which you dogfight your way to victory with guided missiles while performing graceful barrel rolls at Mach 2.

Data East announced the release of two popular arcade titles, Vigilante and Heavy Barrel. Vigilante puts your martial arts skills to the test, while Heavy Barrel sets you to eliminating terrorists.

Maverick Entries

Now here's a quick look at some of the new games that don't fit neatly into any category.

One that I just can't wait to get my hands on is Spotlight's 21st-century hockey game of sorts, called Speedball. In this anything-goes sport, the object is to knock a solid steel ball through your opponent's goal. There's a twist, too: During the game you can collect tokens for later use in improving your team or, if all else fails, in bribing the officials.

Another promising new title is Hot Rod, from California Dreams. This racing simulation/construction set lets you choose one of 25 classic cars, customize it with a variety of performance parts and paint jobs, and race it either on a drag strip or a winding road.

Also watch for a trio of space fantasy shoot-'em-ups from Medalist International, called Exolon, Netherworld and Eliminator. These games will be followed by Savage and Xenophobe, with X-Men arriving in late fall.

Not to be left out, Batman, the Caped Crusader, will wing his way from Gotham City to your C-64, thanks to Data East. Based on the comic-book hero, this game charges you to help Batman defeat his enemies, Penguin and Joker.

Intracorp will also bring a comic-book hero—Superman—to your computer screen, as well as the two TV heroes from Miami Vice. Whether you choose to be the Man of Steel in Superman, or Crockett and Tubbs in Miami Vice, adventure is sure to be on your agenda.

Finally, the award for the most bizarre new title goes to Psygnosis for Captain Fizz Meets the Blaster-Trons, a split-screen game that lets you team up with another player to defeat the evildoers. Interestingly, Psygnosis has just recently begun supporting the C-64 after producing software in other formats. Apparently users aren't the only ones who feel there's plenty of life left in the C-64. ■

Bob Guerra, an editor working in the cardiac unit of the Massachusetts General Hospital, has written numerous articles and reviews for RUN.

Table 1. Manufacturers' addresses.

The Avalon Hill Game Company
4517 Harford Rd.
Baltimore, MD 21214

Accolade
550 S. Winchester Blvd.
Suite 200
San Jose, CA 95128

Activision
(See Mediagenic, below)

Broderbund
17 Paul Drive
San Rafael, CA 94903

California Dreams
780 Montague Expwy.
#403
San Jose, CA 95131

Data East
470 Needles Drive
San Jose, CA 95112

Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404

Epyx
600 Galveston Drive
PO Box 8020
Redwood City, CA 94063

Interplay Productions
(Distributed by Mediagenic)
1575 Corporate Drive
Costa Mesa, CA 92626

Interstel
(Distributed by Electronic Arts)
PO Box 57825
Webster, TX 77598

Intracorp
14160 SW 139th Court
Miami, FL 33186

Lucasfilm Games
(Distributed by Electronic Arts)
PO Box 10307
San Rafael, CA 94912

Mastertronic
711 W. 17th St.
Suite G9
Costa Mesa, CA 92627

Medalist International
(Division of Microprose)
180 Lakefront Drive
Hunt Valley, MD 21030

Mediagenic
3885 Bohannon Drive
Menlo Park, CA 94025

Microillusions
(Distributed by Mediagenic)
17408 Chatsworth St.
Granada Hills, CA 91344

Mindscape
3444 Dundee Rd.
Northbrook, IL 60062

Origin
136 Harvey Rd.
Building B
Londonderry, NH 03053

Psygnosis Ltd.
PO Box 483
Addison, IL 60101

Sega
(See Mindscape, above)

SportTime
3187-G Airway Ave.
Costa Mesa, CA 92626

Spotlight Software
(Distributed by Cinemaware)
4165 East Thousand Oaks Blvd.
Westlake Village, CA 91362

Strategic Simulations Inc.
(Distributed by Electronic Arts)
675 Almanor Ave.
Sunnyvale, CA 94086

Taito
267 West Esplanade
North Vancouver, B.C.
V7M 1A5 Canada

Maze Run

Lose yourself for hours in an endless series of mazes.

By LYSLE SHIELDS

Whether you're an old maze addict or have just come to the pastime, Maze Run will amuse you for hours with its infinite supply of puzzles to be solved in a race against the clock. As you start the program, it generates a new maze every two seconds until you press the space bar to select one. Then you must maneuver the glowing ball from the upper-left corner of the maze to the E in the lower-right corner within the time allotted and with the least retracing of steps.

Each time the ball passes a fresh space, the computer emits a beep and adds a point to your score. If you send the ball back over a previously traveled space, a lower-pitched beep sounds and you lose a point. If the ball passes through the same space several times, you lose a point each time, but Maze Run doesn't use negative numbers, so your score can't go below zero.

When the ball reaches the E at the end of the maze, you get a bonus of 100 points for each second left on the clock. If you run out of time, the game ends, and you can choose another maze.

At first, a full minute is allowed, but whenever you complete a maze before time runs out, the program calculates the allotted time for your next race by adding five seconds to one-and-a-half times the seconds you had left.

As you play, the top of the screen always shows your highest score so far in the session, the number of seconds left to solve the current maze and your score so far for the current maze.

Type in Listings 1 and 2, using *RUN*'s Checksum program to detect typing errors, and be sure to save them to disk before running. Then load and run Listing 2 to create the MAZE.OBJ program. To play, load and run Listing 1. To guide the ball through the maze, use a joystick plugged into either port. R

Lysle Shields wrote this program last year when he was a junior in high school.

Running Instructions: **Type in Listings 1 and 2 and save them to disk. Then load and run Listing 2 to create MAZE.OBJ. To play, load and run Listing 1.**

Listing 1. Loader program. (Available on ReRUN disk. See page 36.)

```
5 IF Q=1 THEN SYS 12288 :REM*8Ø
1Ø POKE 5328Ø,Ø:POKE 53281,Ø:PR
   INT"{SHFT CLR}{CTRL 2}";
                          :REM*2Ø7
2Ø FOR X=1 TO 21          :REM*223
3Ø IF X=1 THEN PRINT"{COMD 4}";
                           :REM*38
4Ø IF X=8 THEN PRINT"{COMD 5}";
                          :REM*116
5Ø IF X=15 THEN PRINT"{COMD 8}"
   ;                      :REM*222
6Ø IF X=21 THEN PRINT"{CTRL 2}"
   ;                      :REM*111
7Ø PRINTTAB(X*.77);"MAZE RUN"
                          :REM*166
8Ø NEXT X                 :REM*131
1ØØ PRINT"{HOME}";         :REM*42
11Ø FOR X=1 TO 2Ø          :REM*35
12Ø PRINTTAB(X*.77)"{8 SPACEs}"
                            :REM*2
13Ø NEXT X                :REM*181
14Ø FOR X=1 TO 15:PRINT:NEXT X
                          :REM*146
15Ø PRINT"{HOME}{11 CRSR DNs}{C
   TRL 8}";TAB(19)"BY{CRSR DN}
   "                      :REM*129
16Ø PRINTTAB(1Ø);"{COMD 7}LYSLE
   {2 SPACEs}E. SHIELDS ]I["
                          :REM*1ØØ
17Ø Q=1:LOAD"MAZE.OBJ",8,1
                          :REM*228
```

Listing 2. MAZE.OBJ creator program. (Available on ReRUN disk. See page 36.)

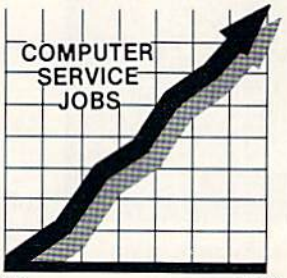
```
Ø REM THIS LIST 2 CREATES (AND
  SHOULD NOT BE CALLED) MAZE.OB
  J                       :REM*253
5 OPEN 8,8,8,"MAZE.OBJ,P,W"
                          :REM*25Ø
6 CT=Ø:PRINT"{SHFT CLR}":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
   E8:PRINT:PRINT"ALL DONE!":EN
   D                      :REM*129 ►
```

RUN it right: **C-64; joystick**

ILLUSTRATED BY ROBERT PIZZO

5 sure steps to a fast start as a high-paid computer service technician

1. Choose training that's right for today's good jobs



Jobs for computer service technicians will almost double in the next 10 years, according to the latest Department of Labor projections. For you, that means unlimited opportunities for advancement, a new career, or even a computer service business of your own.

But to succeed in computer service today, you need training—complete, practical training that gives you the confidence to service any brand of computer. You need NRI training.

Only NRI—the leader in career-building, at-home electronics training for 75 years—gives you practical knowledge, hands-on skill, and real-world experience with a powerful XT-compatible computer you keep. Only NRI starts you with the basics, then builds your knowledge step by step until you have everything you need for a fast start as a high-paid computer service technician.

2. Go beyond "book learning" to get true hands-on experience

NRI knows you learn better by doing. So NRI training works overtime to give you that invaluable practical experience. You first read about the subject, studying diagrams, schematics, and photos that make the subject even clearer. Then you do. You build, examine, remove, test, repair, replace. You discover for yourself the feel of the real thing, the confidence gained only with experience.

3. Get inside a powerful computer system

If you really want to get ahead in computer service, you have to get inside a state-of-the-art computer system. That's why NRI includes the powerful new Packard Bell VX88 computer as the centerpiece of your hands-on training.

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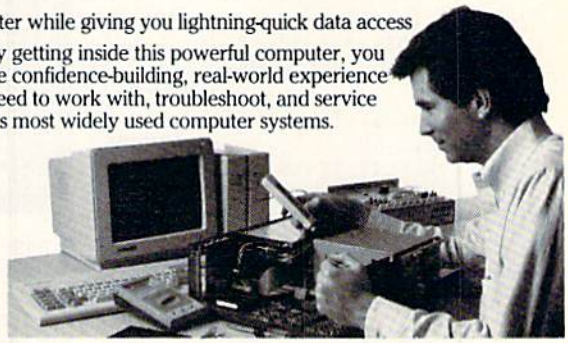
By getting inside this powerful computer, you get the confidence-building, real-world experience you need to work with, troubleshoot, and service today's most widely used computer systems.



4. Make sure you've always got someone to turn to for help

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MAZE RUN

Time goes by quickly in this game, so get through the maze as fast as you can!

```
12 PRINT"{HOME}READING LINE "+S
   TR$(CT):CT=CT+1      :REM*141
15 IF LEN(A$)<62 THEN 55
                        :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
   2Ø)+MID$(A$,43,2Ø)   :REM*242
25 FOR I=1 TO 3Ø        :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55            :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55            :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*67
5Ø NEXT:GOTO 1Ø         :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
   O 7Ø                 :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
   A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
   )):GOTO 7Ø           :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
   Ø)+RIGHT$(A$,LEN(A$)-42)
                        :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55            :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55            :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*148
95 NEXT:GOTO 1Ø         :REM*16Ø
1ØØ REM MAZE RUN ML     :REM*124
1Ø1 DATA ØØ3ØA93785Ø12ØDF3Ø2Ø*D
    3322ØB2322ØBD322Ø8F*312Ø863
    92Ø61362ØEF36       :REM*67
1Ø2 DATA 2ØB2322ØBD322ØØF372Ø*C
    4342ØDF342ØD3322Ø9*352ØØF3
    7A9Ø38D5861A9       :REM*2Ø3
1Ø3 DATA Ø68D5961A9248D5661A9*1
    58D5761Ø5B3ØØ82Ø*372Ø583
    5289ØDC2Ø5333       :REM*89
1Ø4 DATA 4C1C3Ø2Ø6D312Ø93332Ø*4
    4342ØAC322CDØ323Ø24*2Ø923Ø2
    Ø44342Ø8231AD       :REM*113
1Ø5 DATA 5861CD5661DØEAAD5961*C
    D5761DØE22ØBD322Ø87*322Ø363
    2186Ø386Ø2Ø2E       :REM*8
1Ø6 DATA 312ØAD342Ø44342Ø2633*2
    Ø71332ØC3322ØØ632B1*Ø249FF8
    D5A61ADØ1DC2D       :REM*251
1Ø7 DATA ØØDC49FF2D5A6129ØFDØ*Ø
    16ØC9Ø1FØØDC9Ø2FØØD*C9Ø4FØØ
    DC9Ø8FØØD6ØCE       :REM*19
1Ø8 DATA 59616ØEE59616ØCE5861*6
    ØEE58616ØA2ØØ8A9DØØ*D4E8EØ1
    9DØF8A9Ø58DØ5       :REM*163
1Ø9 DATA D4A9ØF8D18D4A9Ø78DØC*D
    4A9878DØ7D4A9218DØ8*D46ØA9C
    38DØØD4A91Ø8D       :REM*253
11Ø DATA Ø1D4A91Ø8DØ4D4A9118D*Ø
    4D46ØA9618DØØD4A9Ø8*8DØ1D4A
    91Ø8DØ4D4A911       :REM*43
111 DATA 8DØ4D46Ø2ØØ632AD5861*C
    D8Ø31DØØ9AD5961CD81*31DØØ16
    ØAD58618D8Ø31       :REM*133
112 DATA AD59618D8131A5Ø329Ø3*Ø
    91C85Ø3B1Ø2C9ØØFØØ9*2Ø16339
    ØØ32ØFB326ØA9       :REM*129
113 DATA FF91Ø22ØEØ326ØA2ØØ8A*9
    DØØ1C9DØØ1D9DØØ1E9D*ØØ1FE8D
    ØF16ØØØØØAC8E       :REM*84
114 DATA 31A2ØØCADØFD88DØFA6Ø*4
    Ø78AD14Ø38DA831AD15*Ø38DA93
    1A9AA8D14Ø3A9       :REM*54
115 DATA 318D15Ø3586ØØØØØ2CDØ*3
    23Ø53CEØ532AEØ532EØ*FFDØ2EA
    98Ø8DØBD4A93C       :REM*193
116 DATA 8DØ532CED232AED232EØ*2
    FDØ1AA9398DD232CED1*32AED13
    2EØ2FDØØBA93Ø       :REM*3Ø
117 DATA 8DD1328DD2322ØBD322Ø*C
    3322Ø1732A281ADAB32*C9ØØDØØ
    32ØBD32C9ØABØ       :REM*251
118 DATA Ø2A2218EØBD46CA8313C*A
    E5961BD765Ø85Ø2BD9Ø*5Ø85Ø3A
    C58616ØADD232       :REM*59
119 DATA 29ØF8DAB32ADD13229ØF*A
    AEØØØFØØC18A9ØA6DAB*328DAB3
    2CADØF46Ø2Ø17       :REM*47
12Ø DATA 32ADAB328DAA324EAB32*1
    8ADAB326DAA328DAB32*ADAB321
    869Ø58DAB32C9       :REM*228
121 DATA 5A9ØØ5A95A8DAB322Ø62*3
    26ØA2ØØADAB328DAA32*ADAB323
    8E9ØA8DAB329Ø       :REM*159
122 DATA Ø3E8DØECADAA32Ø93Ø8D*D
    2328AØ93Ø8DD1326Ø2Ø*1732AEA
    B32AØ64EØØØFØ       :REM*38
123 DATA 168A4898482ØEØ322Ø26*3
    368A868AA88DØEFAØ64*CADØEA6
    ØØØØA9ØØ8DDØ       :REM*13
124 DATA 326ØA9368DD132A93Ø8D*D
    2326ØA9FF8DDØ326ØAD*D1328D6
    3Ø4ADD2328D64       :REM*91
125 DATA Ø46ØØØØ6ØØA2ØØA9ØØ9D*4
    133E8EØØ6DØF86ØAØØ5*B941331
    869Ø1C9ØADØØ8       :REM*251
126 DATA A9ØØ994133881ØEE9941*3
    32ØØ4316ØAØØ5B94133*38E9Ø1C
    9FFDØØ8A9Ø999       :REM*169
127 DATA 4133881ØEE9941332Ø19*3
    16ØAØØ5B94133C9ØØDØ*Ø5881ØF
    6186Ø386ØAØØ5       :REM*184
128 DATA B94133Ø93Ø996FØ4881Ø*F
    5AØØØB94D339969Ø4C8*CØØ6DØF
    56ØØØØØØØØØØ       :REM*22Ø
129 DATA ØØØØØØØØØØØØ13Ø3ØF*1
    2Ø52DA2ØØBD4133DD47*33FØØ3B
    ØØ76ØE8EØØ6DØ       :REM*1Ø
13Ø DATA FØ6ØBD41339D4733E8EØ*Ø
    6DØF5A2ØØBD4733Ø93Ø*9D53Ø4E
    8EØØ6DØF3A2ØØ       :REM*74
131 DATA BD8E339D59Ø4E8EØØ5DØ*F
    56Ø2DØ8Ø9Ø7Ø8A9288D*F8Ø78DF
    829A9298DF9Ø7       :REM*1Ø6
132 DATA 8DF929A2ØØBDBA339DØØ*Ø
    ABDFF339D4ØØAE8EØ4Ø*DØEF2ØC
    A346ØØØØØØ3C       :REM*58
133 DATA ØØØØ6EØØØØ5EØØØØ7EØØ*Ø
    Ø7EØØØØ3CØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*115
134 DATA ØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*42
135 DATA ØØØØØØØØØØØØØØØ7EØØ*Ø
    Ø6ØØØØØ78ØØØØ6ØØØØØ*6ØØØØØ7
    EØØØØØØØØØØØ       :REM*198
136 DATA ØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*44
137 DATA ØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØEAA9ØØ8D5561*AE5861A
    C59612Ø81349Ø       :REM*231
138 DATA Ø5A9Ø18D55618EØØDØ8C*Ø
    1DØAE5661AC57612Ø81*349ØØ9A
    9Ø2ØD55618D55       :REM*2Ø8
139 DATA 61EA8EØ2DØ8CØ3DØAD55*6
    18D1ØDØ6Ø98ØAØAØA18*6932A8A
    9ØØ8D5B618AØA       :REM*1Ø5
14Ø DATA 2E5B61ØA2E5B61ØA2E5B*6
    1186918ØØ3EE5B61AA*AD5B61D
    ØØ2186Ø386ØAE       :REM*248
141 DATA DE34BDDØ348D27DØ8D28*D
    ØE8EØØEDØØ2A2ØØ8EDE*346ØA9Ø
    Ø8D15DØ6ØA9Ø3       :REM*221
142 DATA 8D15DØ6ØØFØCØBØ4Ø6ØE*Ø
    3ØDØ5Ø7Ø8Ø9Ø2ØAØØ2Ø*A3372C1
    E383Ø682ØCF35       :REM*61
143 DATA A9ØØ8D725ØA9188D735Ø*A
    9ØØ8D745ØA9278D755Ø*2Ø3737A
    9Ø18D725ØA9Ø3       :REM*58
144 DATA 8D735ØA9Ø28D745ØA925*8
    D755Ø2Ø3737A9Ø58D72*5ØA9168
    D735ØA9Ø28D74       :REM*73
145 DATA 5ØA9258D755Ø2Ø37372Ø*F
    835A2ØØBD5Ø359D5FØ4*E8EØØ8D
    ØF52Ø71332Ø26       :REM*134
146 DATA 332ØF235ADØ1DC291ØDØ*9
    Ø6ØØDØ11AØ52Ø1215ØE*2ØCF35A
    9ØØ8D725ØA918       :REM*173
147 DATA 8D735ØA9ØØ8D745ØA927*8
    D755Ø2Ø3737A9Ø18D72*5ØA9Ø38
    D735ØA9Ø28D74       :REM*12
148 DATA 5ØA9258D755Ø2Ø3737A9*Ø
    58D725ØA9168D735ØA9*Ø28D745
    ØA9258D755Ø2Ø       :REM*221
149 DATA 37372Ø71332ØF8354CF2*3
    52ØCF35A9Ø18D725ØA9*Ø38D735
    ØA9Ø28D745ØA9       :REM*255
15Ø DATA 258D755Ø2Ø37372Ø7133*2
    Ø26332ØC3324CF235A2*ØØBDØØØ
    49DØØ28BDØØØ5       :REM*29
151 DATA 9DØØ29BDØØØ69DØØ2ABD*Ø
    ØØ79DØØ2BE8DØE5A9A8*8D18DØ6►
```

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Circle 3 on Reader Service card.

MAZE RUN

```
    ØA9188D18DØ6Ø       :REM*2Ø1
152 DATA A9FØ85Ø4A9Ø485Ø5A2Ø
    ØØ6A9Ø38DØB5Ø2Ø438*AD045Ø4
    A8DØ45ØADØ65Ø       :REM*16
153 DATA ØA8DØ65ØADØ55ØØAØA8D*Ø
    55ØADØ35ØØDØ45ØØDØ5*5ØØDØ65
    Ø498F8DØ35Ø98       :REM*72
154 DATA 48ACØB5ØADØ35Ø91Ø468*A
    8EEØB5ØADØB5ØC925FØ*Ø6C8C8C
    Ø4ADØBA18A928       :REM*12
155 DATA 65Ø485Ø49ØØ2E6Ø5E8E8*E
    Ø2CDØA26Ø78A5Ø149Ø4*85Ø1A9Ø
    Ø85FDA92885FE       :REM*18Ø
156 DATA A9FF85FBA9D785FCAØØØ*B
    1FBØA91FDC6FBA5FBC9*FFDØØ2C
    6FCC6FDA5FDC9       :REM*94
157 DATA FFDØØ2C6FEA5FDC9ØØDØ*E
    1A5FEC92ØDØDBA9FF85*FBA91F8
    5FCAØØØB1FD29       :REM*1
158 DATA 558DEE36ØAØDEE368DEE*3
    691FD29554A4A11FB91*FBE6FBD
    ØØ2E6FCE6FDDØ       :REM*85
159 DATA Ø2E6FEA5FDC9ØØDØD6A5*F
    EC928DØDØAØØØB9D239*99ØØ24C
    8CØEØDØF5A5Ø1       :REM*238
16Ø DATA 49Ø485Ø1586ØØØADØ2DD*Ø
    9Ø38DØ2DDADØØDD29FC*Ø9Ø38DØ
    ØDDA9188D18DØ       :REM*77
161 DATA AD16DØØ91Ø8D16DØ6ØA9*Ø
    9A2Ø9DØØD89DØØD99D*ØØDA9DØ
    ØDBE8DØF1AØØ       :REM*218
162 DATA 8D2ØDØA9ØF8D21DØA9ØB*8
    D22DØA9ØC8D23DØ6ØAE*725ØA99
    Ø8DAA5ØA9918D       :REM*151
163 DATA AB5ØA9928DAC5Ø2Ø7937*A
    9938DAA5ØA9948DAB5Ø*A9958DA
    C5ØE8EC735ØFØ       :REM*196
164 DATA Ø62Ø7937189ØF4A9968D*A
    A5ØA9978DAB5ØA9988D*AC5Ø4C7
    9372Ø9837AC74       :REM*89
165 DATA 5ØADAA5Ø91Ø2ADAB5ØC8*C
    C755ØFØØ591Ø2189ØF5*ADAC5Ø9
    1Ø26ØBD765Ø85       :REM*1
166 DATA Ø2BD9Ø5Ø85Ø36ØA9ØØ8D*1
    E38A9Ø28D715Ø2Ø7C38*A2ØEAØØ
    8A9Ø88DØA5ØA9       :REM*2Ø2
167 DATA Ø22Ø42392C1E381ØØ16Ø*2
    ØCE38BØØ62Ø1F38189Ø*EF2ØF43
    8A9Ø22Ø4239AD       :REM*1Ø9
168 DATA Ø35ØC9Ø1FØ18ADØ45ØC9*Ø
    1FØ1BADØ55ØC9Ø1FØ1E*ADØ65ØC
    9Ø1FØ214C7D39       :REM*2ØØ
169 DATA E8A9Ø22Ø4239E84CBE37*C
    AA9Ø22Ø4239CA4CBE37*C8A9Ø22
    Ø4239C84CBE37       :REM*218
17Ø DATA 88A9Ø22Ø4239884CBE37*Ø
    Ø8EØC5Ø2Ø67392Ø3AA*8EØB5ØB
    DØ35ØC9ØØFØØA      :REM*1ØØ
171 DATA E8EØØ4DØF4A2ØØ189ØEF*E
    ØØ3FØ15EØØ2FØ1EEØØ1*FØ27AEØ
    C5ØE8A9Ø12Ø42       :REM*48
172 DATA 39E84C4239AEØC5Ø88A9*Ø
    12Ø4239884C4239AEØC*5ØC8A9Ø
    12Ø4239C84C42       :REM*169
173 DATA 39AEØC5ØCAA9Ø12Ø4239*C
    A4C4239A2Ø6AØØ3A9ØØ*EØØC9ØØ
    EEØ2CBØØACØØ6      :REM*23Ø
174 DATA 9ØØ6CØ4ABØØ29ØØ3AD71*5
    Ø2Ø4239C8CØ4EDØE1E8*EØ3ØDØD
    A6ØA2Ø6AØØ3A9       :REM*144
175 DATA ØØEØØC9ØØEEØ2CBØØACØ*Ø
    69ØØ6CØ4ABØØ29ØØ6AD*715Ø2Ø4
    239C8CØ4EDØE1       :REM*243
176 DATA E8EØ3ØDØDA6Ø2Ø173948*A
    DØ35ØC9ØØFØ18ADØ45Ø*C9ØØFØ1
    1ADØ55ØC9ØØFØ       :REM*246
177 DATA ØAADØ65ØC9ØØFØØ36838*6
    Ø68186Ø48E82Ø56398D*Ø35ØCAC
    A2Ø56398DØ45Ø       :REM*54
178 DATA E8C82Ø56398DØ55Ø8888*2
    Ø56398DØ65ØC8686Ø48*E8E82Ø5
    6398DØ35ØCACA       :REM*112
179 DATA CACA2Ø56398DØ45ØE8E8*C
    8C82Ø56398DØ55Ø8888*88882Ø5
    6398DØ65ØC8C8       :REM*187
18Ø DATA 686Ø48ADØ1DC291ØDØØ5*A
    9FF8D1E382Ø5C396891*Ø26Ø2Ø5
    C39B1Ø26ØBDØD       :REM*2Ø9
181 DATA 5Ø85Ø2BD3F5Ø85Ø36ØAD*1
    2DØ4DØØ5Ø8DØØ5Ø6DØ1*5Ø8DØ15
    Ø4DØ25Ø8DØ25Ø       :REM*217
182 DATA 6ØA9ØØ8D715Ø2ØA5386Ø*A
    9AD85Ø2A95Ø85Ø3A2ØØ*A5Ø29DØ
    D5ØA5Ø39D3F5Ø       :REM*114
183 DATA EØ31FØØFE818A94865Ø2*8
    5Ø29ØØ2E6Ø3189ØE3A9*ØØ85Ø2A
    9Ø485Ø3A2ØØA5       :REM*246
184 DATA Ø29D765ØA5Ø39D9Ø5Ø18*A
    92865Ø285Ø29ØØ2E6Ø3*E8EØ19D
    ØE66Ø8141ØØØØ      :REM*151
185 DATA ØØØØ83835555ØØØØØØØØ*8
    3838141ØØØØØØØØFFFF*5555ØØØ
    ØØØØØFFFF8181       :REM*154
186 DATA 8Ø8Ø8Ø8Ø838355958Ø8Ø*8
    Ø8Ø8383818188Ø8Ø8Ø8Ø*FFFF959
    58Ø8Ø8Ø8ØFFFF       :REM*122
187 DATA 4343Ø3Ø3Ø3Ø383835757*Ø
    3Ø3Ø3Ø3838383Ø3Ø3*Ø3Ø3FFF
    F5757Ø3Ø3Ø3Ø3       :REM*8Ø
188 DATA FFFF8383838383838383*5
    7978383838383838383*8383838
    3FFFFFFFFFFFF       :REM*226
189 DATA FFFFFFFFFFBFAFAØAØAØ*A
    ØAØFFFFFFØØØØØØØØØ*FFFEFAØ
    AØAØAØAØAAØAØ       :REM*183
19Ø DATA AØAØAØAØAØAØØØØØØØØØ*Ø
    ØØØØØØØØAØAØAØAØAØA*ØAØAAØA
    ØAØAØAØA59555       :REM*159
191 DATA ØØØØØØØØØØ555555ØAØA*Ø
    AØAØA565555ØØØØØØØ*ØØØ5Ø5Ø
    9ØØØØØØØØØ5Ø       :REM*78
192 DATA 5Ø6ØØBØFØFØØØØØØØØØ*E
    ØFØFØØØØØØØØØØ8BAA*EEAA44
                        :REM*127
193 DATA -1             :REM*51
```

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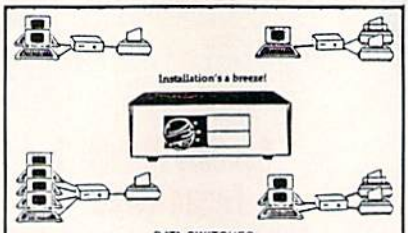

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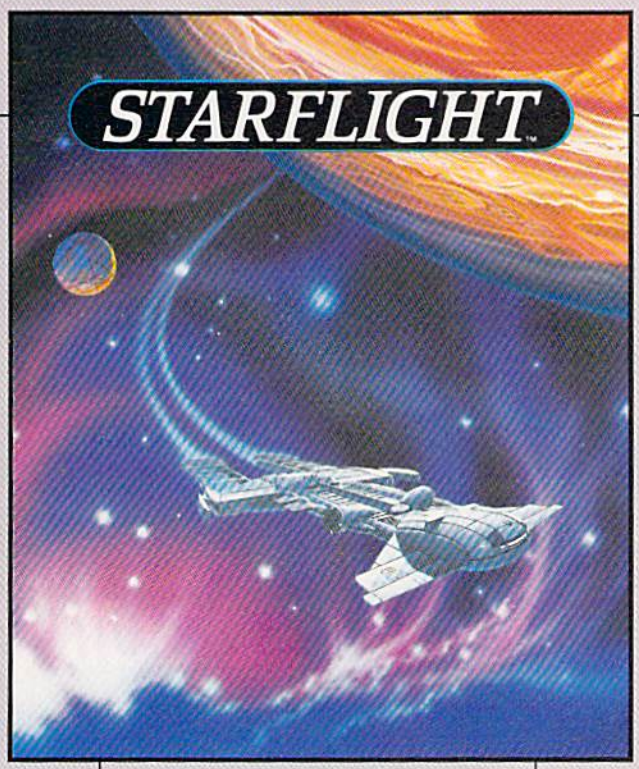

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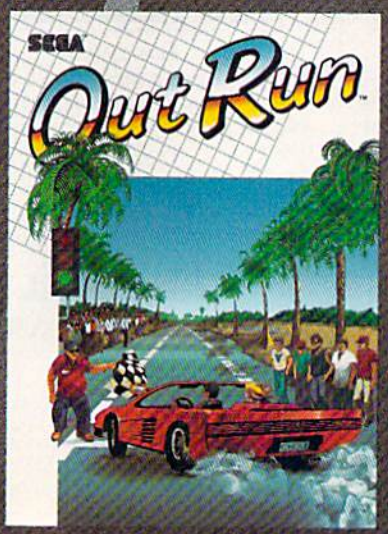

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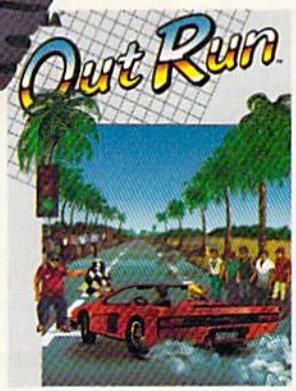

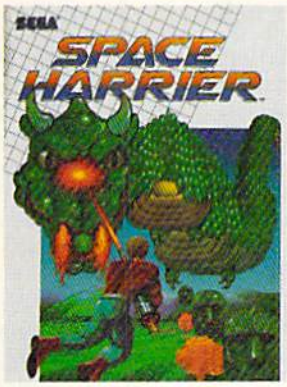

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Functional Keys

Redefine your C-64 function keys to handle such tasks as saving, loading and running programs.

By ANDREW LITTLE

User-definable function keys are a boon to C-128 programmers, but unfortunately the C-64 doesn't offer them. My Function Key 64 program fills that gap. Written in 6502 assembly language, it lets you define the eight function keys on the C-64 just as on the C-128.

The program resides at memory address $C000, so the SYS 49152 command turns it on. QUIT turns it off until you SYS 49152 again.

Enter the word KEY to display a list of the eight function keys as they are currently defined. Table 1 shows the definitions I've given them.

How do you install your own definitions? Try typing KEY 2, "LOAD"+CHR$(34)+"$"+CHR$(34)+",8"+CHR$(13)+"LIST"+CHR$(13) and pressing return. You have just defined F2 to print the following:

```
LOAD "$",8 <RETURN>
LIST <RETURN>
```

Now press F2 and see what happens. A listing of the disk directory appears, right? Wrong. Unlike user definitions on the C-128, these can be turned on and off as desired, which lets you run programs that expect the function keys to do what Commodore said. KEYON turns them on, and KEYOFF turns them off.

Table 1. Function keys as defined in the program.

Key 1—LOAD
Key 2—undefined
Key 3—SAVE
Key 4—undefined
Key 5—LIST+CHR$(13)
Key 6—undefined
Key 7—RUN+CHR$(13)
Key 8—undefined

Your definitions must consist of strings in quotes, such as "LIST", and character controls, such as CHR$(13), tied together with plus signs. Follow the same rules as for assigning string variables. You can assign up to 25 characters to each key. For example, "LIST" counts as four characters and CHR$(13) as one. If you assign more than 25 characters to a key, it will overwrite the following key.

Add Function Key 64 to your programming repertoire. With it, you can make your programs a lot more versatile! R

Andrew Little, a professional programmer, does most of his personal computing on a C-128, yet has written many small programs that make the C-64 easier to use.

Running Instructions: **Type in Listings 1 and 2; then run Listing 2 to create the machine language KEY64 file. To use, load and run Listing 1.**

Listing 1. Loader program. (Available on ReRUN disk. See page 36.)

```
10 IF A=0 THEN A=1:LOAD"KEY64",
   8,1                    :REM*165
20 SYS 49152              :REM*186
30 END                    :REM*158
```

Listing 2. KEY64 machine language program creator. (Available on ReRUN disk. See page 36.)

```
0 REM THIS LISTING CREATES (AND
   SHOULD NOT BE CALLED) KEY64
                          :REM*175
5 OPEN 8,8,8,"KEY64,P,W":REM*24
6 CT=0:PRINT"{SHFT CLR}":REM*56
10 READ A$:IF A$="-1" THEN CLOS
   E8:PRINT:PRINT"ALL DONE!":EN
   D                      :REM*129
12 PRINT"{HOME}READING LINE "+S
   TR$(CT):CT=CT+1        :REM*141
15 IF LEN(A$)<62 THEN 55
                          :REM*254
20 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,20)     :REM*242
25 FOR I=1 TO 30          :REM*181
30 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*209
35 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55              :REM*85
40 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55              :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*67
50 NEXT:GOTO 10           :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
   O 70                   :REM*184
60 IF LEN(A$)<42 THEN B$=LEFT$(
   A$,20)+RIGHT$(A$,(LEN(A$)-21
   )):GOTO 70             :REM*176
65 B$=LEFT$(A$,20)+MID$(A$,22,2
   0)+RIGHT$(A$,LEN(A$)-42)
                          :REM*140
70 FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*140
80 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55              :REM*56 ►
```

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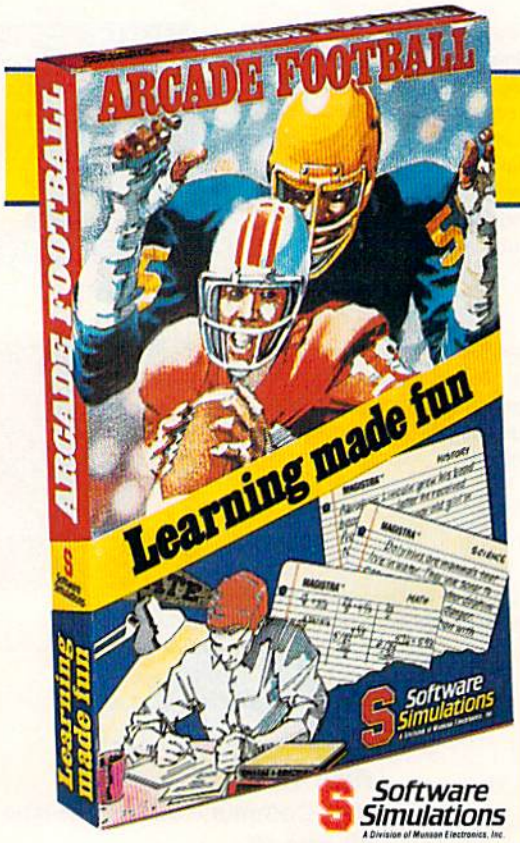
```
85 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55              :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*148
95 NEXT:GOTO 1Ø           :REM*16Ø
1ØØ REM KEY64 ML          :REM*119
1Ø1 DATA ØØCØA9ØEA2CØ8DØ4Ø38E*Ø
   5Ø32Ø93C26Ø8C51Ø2AØ*ØØB9E3C
   2FØ1CD9ØØØ2DØ          :REM*248
1Ø2 DATA Ø4C84C13CØAØØØB9E8C2*F
   Ø2ØD9ØØØ2DØØ4C84C23*CØ4C7CA
   5A97CA2A58DØ4          :REM*111
1Ø3 DATA Ø38EØ5Ø3A9ECAØC22Ø1E*A
   B4C4FC1B9ØØØ2DØØ34C*77CØC94
   FFØØ34CF5C1C8          :REM*183
1Ø4 DATA B9ØØØ2C94EDØØ34C4ØC1*C
   946FØØ34CFØC1C8B9ØØ*Ø2C946F
   ØØ34CFØC14C4F          :REM*182
1Ø5 DATA C1AØØØA98D2ØD2FFA2ØØ*B
   DE8C2FØØ72ØD2FFE84C*8ØCØA92
   Ø2ØD2FF981869           :REM*78
1Ø6 DATA 312ØD2FFA92C2ØD2FFA9*2
   Ø2ØD2FF98ØAØAØAØAØA*AAA9ØØ8
   D57Ø2BDØØCDFØ          :REM*83
1Ø7 DATA 7A8D52Ø2C92Ø9Ø2EC95B*B
   Ø2AAD57Ø2FØØ5A92B2Ø*D2FFBDØ
   ØCDFØ6ØE88D52          :REM*224
1Ø8 DATA Ø2C92Ø9ØØAC95BBØØ62Ø*D
   2FF4CC8CØCAA9FF8D57*Ø24CE8C
   ØAD57Ø2FØØ5A9          :REM*15Ø
1Ø9 DATA 2B2ØD2FFA9432ØD2FFA9*4
   82ØD2FFA9522ØD2FFA9*242ØD2F
   FA9282ØD2FF8E          :REM*191
11Ø DATA 53Ø28C54Ø2A9ØØAE52Ø2*2
   ØCDBDAE53Ø2E8AC54Ø2*A9292ØD
   2FFA9FF8D57Ø2          :REM*13
111 DATA 4CAECØA98D2ØD2FFC8CØ*Ø
   8BØØ34C7ECØ2ØD2FF4C*74A478A
   95EA2C18D8FØ2          :REM*213
112 DATA 8E9ØØ2584C74A478A948*A
   2EB8D8FØ28E9ØØ2584C*74A4EE5
   6Ø2A9FFCD56Ø2          :REM*89
113 DATA DØØ8A9FF8D55Ø28D56Ø2*A
   2ØØAD8DØ2C9Ø1DØØ1E8*A5CBC9Ø
   3DØØEEØØØDØØ5          :REM*211
114 DATA AØØ74CCAC1AØØ84CCAC1*C
   9Ø4DØØEEØØØDØØ5AØØ1*4CCAC1A
   ØØ24CCAC1C9Ø5          :REM*31
115 DATA DØØEEØØØDØØ5AØØ34CCA*C
   1AØØ44CCAC1C9Ø6DØØE*EØØØDØØ
   5AØØ54CCAC1AØ          :REM*89
116 DATA Ø64CCAC14C48EB4C48EB*C
   C55Ø2FØ2Ø8C55Ø28898*ØAØAØAØ
   AØAA8A2ØØB9ØØ          :REM*36
117 DATA CDFØØ89D77Ø2E8C84CDC*C
   186C6A94Ø85CB6ØA2ØB*6CØØØ3A
   2FFAØØ1867A84          :REM*146
118 DATA 7B2Ø73ØØ2Ø73ØØ2Ø73ØØ*2
   Ø73ØØ9ØØ34CFØC138E9*31ØAØAØ
   AØAØA8D51Ø22Ø          :REM*2Ø7
119 DATA 73ØØC92CFØØ34CFØC12Ø*7
   3ØØDØØ34C88C2C92BFØ*F4C922D
   ØØ34C73C2C943          :REM*188
12Ø DATA FØØ34CFØC12Ø73ØØ2Ø73*Ø
   Ø2Ø73ØØC924FØØ34CFØ*C12Ø73Ø
   ØC928DØF62Ø9B          :REM*63
121 DATA B78AAC51Ø299ØØCDC88C*5
   1Ø22Ø79ØØC929FØBA4C*FØC1C92
   8FØDD4CFØC12Ø          :REM*32
122 DATA 73ØØFØD2C922FØA7AC51*Ø
   299ØØCDEE51Ø24C73C2*AC51Ø2A
   9ØØ99ØØCD4C74          :REM*2Ø3
123 DATA A4AØØØA9FF8D55Ø28C51*Ø
   2A2ØØ8E56Ø2AD51Ø2ØA*ØAØAØAØ
   AA8BDC7C2FØØC          :REM*235
124 DATA C92AFØ1299ØØCDC8E84C*A
   BC2EE51Ø299ØØCDE84C*A2C26Ø4
   C4F414422ØØØØ          :REM*73
125 DATA 534156452ØØØØ4C4953*5
   4ØDØØØØ52554EØDØØØØ*2A51554
   954Ø04B4559ØØ          :REM*94
126 DATA 8D8D4B45592Ø49532Ø44*4
   95341424C45448D8D53*59532Ø3
   439313532Ø54           :REM*254
127 DATA 4F2Ø52452D454E41424C*4
   58DØØ                  :REM*25
128 DATA -1               :REM*241 ■
```

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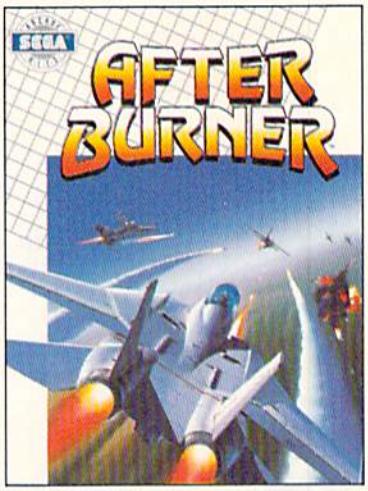

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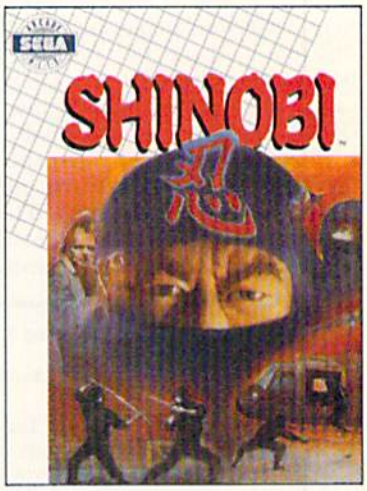

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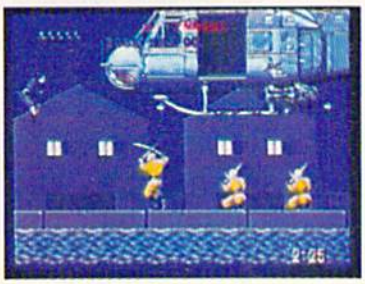

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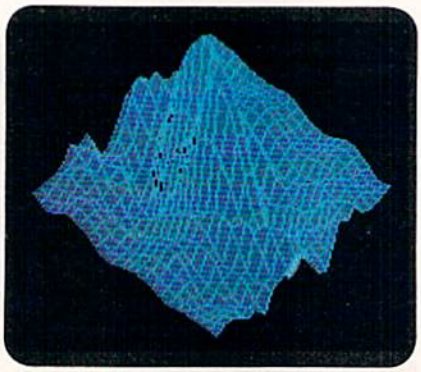
3-D Surfaces

Now you can merge mathematics with your C-128 to display intricate landscapes.

By BRANDON CORFMAN

Have you ever been awed by those three-dimensional surface models in science-fiction movies and wished you could do the same on your home computer? Now, with 3-D Surfaces, you can create your own landscapes on your C-128. Using the multicolor screen, the program can generate surface models at three levels of complexity—and even turn them upside down!



One of eight hi-res landscapes produced by 3-D Surfaces.

Using the Program

When you run 3-D Surfaces, the program gives you a choice of several options. First, you can plot any one of eight different landscapes by pressing numbers 1 to 8 on the keyboard. You're next asked whether you want to plot your chosen landscape in low, medium or high resolution. (The higher the resolution, the longer your 128 takes in calculating and drawing time.) The final option is whether to plot the surface upside down. Once you've answered yes or no to this question, you're well on your way.

To decrease execution time, 3-D Surfaces kicks the 128 into Fast mode for making all its calculations. Unless you are using the highest resolution, however, the computing time should not be very long. If you have an RGB monitor, you can track the program's progress on the 80-column screen. The program returns to Slow mode when it's ready to plot.

Saving and Loading Screens

If you like a particular screen and want to save it to disk for use in your own programs or for later viewing, just break out of the program with the run-stop key and use the following command, with your own filename in place of "picture."

```
BSAVE "picture",B0, P7168 TO P16383
```

To load the same screen for viewing, use these commands:

```
BLOAD "picture":GRAPHIC 3
```

I hope you enjoy the landscapes 3-D Surfaces provides. Ⓡ

Brandon Corfman, a typesetter for a printing company, also runs his own word processing/desktop publishing business.

Running Instructions: **Type in Listing 1, using *RUN*'s Checksum program, save it to disk and run it.**

Listing 1. 3-D Surfaces program. (Available on ReRUN disk. See page 36.)

```
10 FAST:COLOR0,1:COLOR4,1:COLOR
   1,7:COLOR2,15:COLOR3,4:COLOR
   6,7:GRAPHIC3,1:GRAPHIC0:TRAP
   680                    :REM*52
20 H=100:D=250:LX=-3:HX=3:LY=-3
   :HY=3                  :REM*255
30 PRINT "{SHFT CLR}{CTRL 8}"SP
   C(14)"{12 SHFT Cs}":PRINTSPC
   (14)"3-D SURFACES":PRINTSPC(
   14)"{12 SHFT Cs}"      :REM*35
40 PRINT "{2 CRSR DNs}{CTRL 4}W
   HICH FUNCTION? (1-8)":SLOW
                          :REM*115
50 GETKEYFU$:FU=VAL(FU$):REM*22
60 IFFU=.ORFU=9THEN40     :REM*24
70 ONFUGOSUB600,610,620,630,640
   ,650,660,670           :REM*115
80 PRINT "{CRSR DN}{CTRL 9}L{CT
   RL 0}O, {CTRL 9}M{CTRL 0}ED
   OR {CTRL 9}H{CTRL 0}I-RES CA
   LCULATIONS?"           :REM*85
90 GETKEYA$:IFA$<>"L"ANDA$<>"H"
   ANDA$<>"M"THEN90       :REM*207
100 IFA$="L"THENM=7:N=7:GOTO130
                          :REM*222
110 IFA$="M"THENM=15:N=15:GOTO1
   30                     :REM*102
120 M=23:N=23             :REM*180
130 PRINT "{CRSR DN}GRAPH UPSID
   E DOWN? (Y/N)"         :REM*230
140 GETKEYA$:IFA$<>"Y"ANDA$<>"N
   "THEN140               :REM*146
150 IFA$="N"THENUD=1:GOTO170
                          :REM*48
160 UD=-1                 :REM*51
170 FAST:GOSUB340         :REM*83
180 DIMXC(M+1,N+1),YC(M+1,N+1):
   ZX=(HX-LX)/M:ZY=(HY-LY)/N
                          :REM*116
190 PRINT CHR$(27)"X"     :REM*5
200 PRINT "{SHFT CLR}{CTRL 2}CO
   MPUTING VALUES"        :REM*102
210 GOSUB 460:PRINT"{SHFT CLR}{
   CTRL 9}{CTRL O}SWITCH TO 40
    COLUMNS"              :REM*239
220 GRAPHIC3:SLOW:FORX=DXTOTXST
   EPSX:FORY=DYTOTYSTEPSY
                          :REM*138
230 X1=XC(X,Y)/4:X2=XC(X,Y+1)/4
   :X3=XC(X+1,Y+1)/4:X4=XC(X+1
   ,Y)/4                  :REM*200
240 Y1=YC(X,Y):Y2=YC(X,Y+1):Y3=
   YC(X+1,Y+1):Y4=YC(X+1,Y)
                          :REM*38
```

RUN it right: **C-128 (40-Column mode)**

```
25Ø DRAWØ,X1,Y1TOX2,Y2TOX3,Y3TO
    X4,Y4TOX1,Y1:XD=(X1-X3)/2:Y
    D=(Y1-Y3)/2          :REM*148
26Ø IFABS(XD)<1THENIFABS(YD)<1T
    HEN31ØELSE28Ø        :REM*214
27Ø IFABS(YD)<1THEN31Ø  :REM*2Ø1
28Ø PAINTØ,X3+XD,Y3+YD,Ø
                         :REM*148
29Ø IFY1<Y3THENDRAW1,X1,Y1TOX2,
    Y2TOX3,Y3TOX4,Y4TOX1,Y1:PAI
    NT1,X3+XD,Y3+YD,Ø:GOTO31Ø
                         :REM*13Ø
3ØØ DRAW3,X1,Y1TOX2,Y2TOX3,Y3TO
    X4,Y4TOX1,Y1:PAINT3,X3+XD,Y
    3+YD,Ø               :REM*2Ø4
31Ø DRAW2,X1,Y1TOX2,Y2TOX3,Y3TO
    X4,Y4TOX1,Y1         :REM*32
32Ø NEXTY,X              :REM*92
33Ø GETKEYA$:GRAPHICØ:RUN
                         :REM*147
34Ø IFRE<>1ANDRE<>2THENRE=1
                         :REM*151
35Ø IFRE=1THENHT=186:HH=93
                         :REM*1Ø6
36Ø IFRE=2THENHT=386:HH=193
                         :REM*3Ø
37Ø IFLX>HXTHENZ=LX:LX=HX:HX=Z
                         :REM*1Ø9
38Ø IFLY>HYTHENZ=LY:LY=HY:HY=Z
                         :REM*6Ø
39Ø DX=1:TX=M:SX=1:DY=1:TY=N:SY
    =1                   :REM*255
4ØØ IFGT<>2THENGT=1      :REM*195
41Ø IFRE<>2THENRE=1      :REM*191
42Ø IFGT=2THENBEGIN       :REM*4
43Ø IFA<.THENDX=M:TX=1:SX=-1
                         :REM*21
44Ø IFB<.THENDY=N:TY=1:SY=-1:BE
    ND                   :REM*34
45Ø RETURN               :REM*82
46Ø M1=31Ø/M:M2=16Ø/M:N1=31Ø/N:
    N2=16Ø/N:RD=18Ø/{PI}:X=24Ø/
    SQR(2):Y=24Ø/SQR(2)  :REM*63
47Ø PX=31Ø+.8886207*(X-Y):PY=HH
    -.4586429*(X+Y):X1=1.777241
    *X/M:X2=1.777241*Y/N:Y1=.91
    72858*X/M:Y2=.9172858*Y/N:G
    =LX-ZX:I=.           :REM*149
48Ø DOWHILEI<M+1          :REM*79
49Ø I=I+1:PRINT"{HOME}{2 CRSR D
    Ns} "I"{CRSR LF} OUT OF"M+1
    :G=G+ZX:J=.:Y=LY-ZY:REM*2Ø2
5ØØ DOWHILEJ<N+1          :REM*83
51Ø J=J+1:Y=Y+ZY:XC(I,J)=(PX+X2
    *J-X1*I):YC(I,J)=PY+Y2*J+Y1
    *I-H*FNZ(G)*UD       :REM*111
52Ø IFYC(I,J)<SNTHENSN=YC(I,J)
                          :REM*6
53Ø IFYC(I,J)>SMTHENSM=YC(I,J)
                         :REM*1Ø3
54Ø LOOP:LOOP            :REM*7Ø
55Ø IFSM<HT ANDSN>.THENRETURN
                         :REM*91
56Ø AV=(SM+SN)/2:SM=SM-AV:SN=SN
    -AV:MU=HT/(SM-SN)    :REM*1Ø5
57Ø FORX=1TOM+1:FORY=1TON+1
                         :REM*222
58Ø YC(X,Y)=MU*(YC(X,Y)-AV)+HH
                         :REM*69
59Ø NEXTY,X:RETURN       :REM*213
6ØØ DEFFNZ(X)=SIN(X{UP ARROW}2+
    3*Y{UP ARROW}2)/(X{UP ARROW
    }2+Y{UP ARROW}2)+(X{UP ARRO
    W}2+5*Y{UP ARROW}2)*EXP(1-X
    {UP ARROW}2-Y{UP ARROW}2)/2
    :RETURN              :REM*114
61Ø DEFFNZ(X)=(X{UP ARROW}2+5*Y
    {UP ARROW}2)*EXP(1-X{UP ARR
    OW}2-Y{UP ARROW}2)/2-SIN(3*
    X{UP ARROW}2+Y{UP ARROW}2)/
    (X{UP ARROW}2+Y{UP ARROW}2)
    :RETURN              :REM*95
62Ø DEFFNZ(X)=-X{UP ARROW}3/1Ø-
    (SIN(1-X{UP ARROW}2-Y{UP AR
    ROW}2)+COS(1-X{UP ARROW}2-Y
    {UP ARROW}2))/2:RETURN
                         :REM*73
63Ø DEFFNZ(X)=SIN(3*X)*SIN(3*Y)
    /5+.7*SIN(2*X{UP ARROW}2+3*
    Y{UP ARROW}2)/(X{UP ARROW}2
    +Y{UP ARROW}2):RETURN
                         :REM*193
64Ø DEFFNZ(X)=COS(3*X)+2*SIN(X{
    UP ARROW}2+Y{UP ARROW}2)/(X
    {UP ARROW}2+Y{UP ARROW}2)-X
    /2:RETURN            :REM*72
65Ø DEFFNZ(X)=.3*(SIN(X{UP ARRO
    W}2+Y)+COS(Y{UP ARROW}2+X))
    :RETURN              :REM*234
66Ø DEFFNZ(X)=(SIN(4*X{UP ARROW
    }2+Y{UP ARROW}2)+2*SIN(X*Y)
    )/(4*X{UP ARROW}2+Y{UP ARRO
    W}2):RETURN          :REM*1ØØ
67Ø DEFFNZ(X)=(SIN(3*X)+SIN(3*Y
    )):RETURN            :REM*1Ø
68Ø GRAPHICØ:COLOR6,3:SCNCLR:SL
    OW:END               :REM*165 ■
```

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TELECOMPUTING WORKSHOP

Looking for a good commercial terminal program? Check out these ratings.

By LOREN LOVHAUG

THERE ARE A SUBSTANTIAL number of high-quality C-64 or 128 terminal-emulation programs available in the public domain, so it's not surprising that few companies have attempted to market commercial terminal packages for these computers. Those who do must, to make a profit, strive to create a commercial package that's better, easier to use or substantially different. Read on for an examination of some terminal programs currently on the market for the 64 and 128.

BOBSTERM PRO

Just over four years ago, Bob Lentini wrote what was considered to be the consummate commercial eight-bit terminal package—BobsTerm Pro 64. To this day, many people feel that BobsTerm Pro 64 and its successor, BobsTerm Pro 128, are the finest terminal packages available for the 64 and 128. The programs earned this reputation by being extremely functional and easy to use.

Both versions of BobsTerm Pro are menu-driven and incorporate impressive-looking pop-up command windows and user-selectable screen fonts. They include full buffer editors that are as complete as most word processing programs and can edit files larger than the buffer's capacity. Both of them support protocol uploading and downloading, as well as simple text transfer and capture.

In addition, an integrated mini-BBS program lets your computer act as a remote host. While this option couldn't serve as a replacement for a full BBS program, it's superb for those moments when you need to quickly receive programs and data or when you don't have time to babysit your computer during a transfer. Both BobsTerm versions also support user-definable function keys and phone book and include autodial/multidial support and a complete macro programming language that makes it possible to totally automate telecomputing sessions.

To all of this, add support for seemingly every modem on the market, the ability to create custom configurations and an excellent manual with easy-to-comprehend instructions, and it's easy to understand why BobsTerm is held in such high regard. (Running only on the 80-column screen, the 128 version gives you, in addition to the above, user-definable and pre-made mainframe terminal emulations, as well as built-in CP/M disk read/write capability.)

With all of these features included, is anything missing from the BobsTerm packages? Yes. Neither version supports Commodore RAM expansion units or Commodore ASCII for color graphics BBSing. Also lacking is support for file-transfer protocols other than Xmodem and Punter. A final drawback is that both the 64 and 128 packages are copy protected: the 64 version via a disk-based scheme and the 128 version through a dongle. However, for the serious telecommunicator, BobsTerm Pro is well worth the investment.

SPEEDTERM

SpeedTerm is a command-driven, VT-52-based terminal emulation package for the 64 and 128 that's difficult to learn and vastly underpowered as a commercial entry. It begins by presenting a list of modems to choose from and then gives the user an MS-DOS- or CP/M-like command line. At this point, to access SpeedTerm's features and to adjust various parameters, it's up to you to type commands like BAUD, CLRB and CALL. Many of these commands have nebulous options that are difficult to remember. A simple, numbered menu would be much better. There's no reason why you should have to learn the equivalent of DOS commands to log on to a local BBS.

Once you are in Terminal mode, SpeedTerm is operated through key sequences activated at the press of the Commodore key and one other. Many of these commands control crucial settings. However, it seems that after protocol file transfer or dialed numbers, the settings return to their defaults. This could cause a beginner to become quite confused and frustrated.

Both versions of the program include support for Xmodem and Punter file transfers and have adequate capture buffers as far as size is concerned. Unfortunately, there's neither support for buffer editing nor an option for translating buffers between Commodore and normal ASCII.

Also missing from SpeedTerm are a

Table 1. Manufacturers' addresses.

BobsTerm Pro
Progressive Peripherals and Software
464 Kalamath St.
Denver, CO 80204
C-64 version: $49.95
C-128 version: $59.95

SpeedTerm
Abacus
5370 52nd St. SE
Grand Rapids, MI 49508
C-64 and C-128 versions in one package: $39.95

Ultraterm III
c/o Steve Boerner
PO Box 364
Brockport, NY 14420
$25

geoTerm
In GEOS Power Pak II
c/o RUN Magazine
80 Elm St.
Peterborough, NH 03458
C-64 and C-128 versions in one package: $24.97

phone book facility and a number of other features you'd expect in a full-featured public domain terminal package. In view of these lacks, as well as its clumsy user interface, I don't see much reason to purchase SpeedTerm.

ULTRATERM III

Until last year, no program for the C-128 could challenge BobsTerm Pro 128 for overall terminal program supremacy. However, Steve Boerner's Ultraterm III is a legitimate heir to the throne.

This program combines most of the features of BobsTerm Pro 128 and adds support for RAM expansion and Xmodem 1K. It also has no copy protection and is less expensive. On the other hand, Ultraterm III does not have BobsTerm Pro's macro programming capabilities or the mainframe terminal emulation support, and its buffer editor is not as robust.

However, the other bells and whistles are in place and some are actually superior to BobsTerm. For example, Ultraterm's user interface is slightly more sophisticated in that it supports both pull-down menus and mnemonic keyboard commands. This makes the program easy for beginners to use, while affording experienced Ultratermers the luxury of not having to step through on-screen sub-windows and menus. Ultraterm also has slightly better printer support.

Overall, Ultraterm III is a good, inexpensive alternative for 128 owners.

GEOTERM

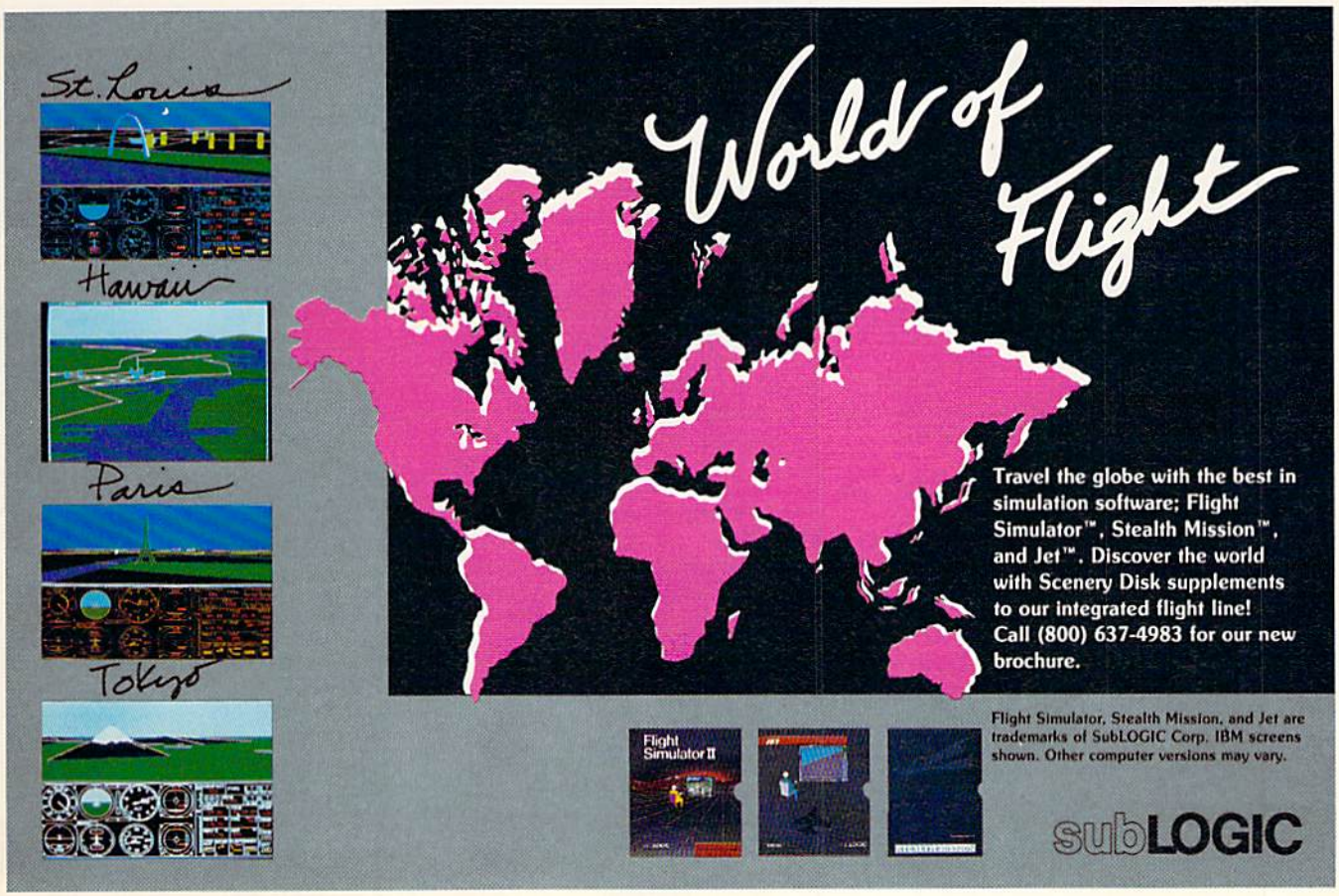
One year ago, GEOS programmer Bill Coleman accomplished what was considered impossible. He created a functional terminal program to run under GEOS. Now, his latest versions of geoTerm 64 and 128, found on *RUN*'s GEOS Power Pak II, are a must for telecommunicators who download GEOS files.

The programs sport rather small 30K buffers, but since GEOS itself has extensive RAM expansion support, it's tolerable. GeoTerm, which has a nice phone book, supports Xmodem, Punter and Xmodem 1K, as well as disk-to-disk file transfers. Bill also provided keyboard shortcuts, in addition to the obligatory GEOS menus, and a built-in GEOS file converter.

GeoTerm has saved me many tedious hours of downloading GEOS files, rebooting GEOS and jumping between programs. ■

Loren Lovhaug is a programmer and writer with lots of telecommunications experience. Along with being SYSOP of Q-Link's C-128 Special Interest Group, he publishes Twin Cities 128, *a newsletter for C-128 users. You can write to him care of Telecomputing Workshop, RUN Magazine, 80 Elm St., Peterborough, NH 03458.*

You can also send him electronic mail on QuantumLink (LOVHAUG) or GEnie (Sparrow.J).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GEOWATCH

Breaking GEOS's 80-column color barrier!

By WILLIAM COLEMAN

ONE OF THE QUICKEST ways to convince me to write a program is to tell me it can't be done. Recently, a friend of mine mentioned that it's too bad GEOS 128 has only a monochrome screen. I told him that it has color; unfortunately, no one utilizes it. Unbelieving, he said it must be impossible because *everyone* says GEOS 128 doesn't have color.

I couldn't let this mind-set continue, so I created geoInvaders—an 80-column, color, arcade-style game for GEOS 128 that's a variation of the classic Space Invaders game.

Type in Listing 1 and save it to disk, using some filename *other* than geoInvaders. Next, place a GEOS disk in drive 8, making sure that it's a 1541 or 1571 drive and *not* a 1581. Then run the program; it creates geoInvaders on the disk.

To play, simply double-click on the geoInvaders icon from the 128 deskTop. (Take note that this program will *not* run with GEOS 64.) If you're not in 80-Column mode, the deskTop asks if you want to switch. Once the playing screen is drawn, you'll see four icons: New, Play, Info and Quit. To start or continue a game, click on the Play icon. To pause, press escape. Click on New to set up a new game.

The current and high scores are displayed, along with the number of the present round. S's located to the right of the round indicate the number of ships remaining.

The keyboard or mouse are the best input devices to use with geoInvaders. A joystick doesn't work as well—it's a bit jerky when the screen is full.

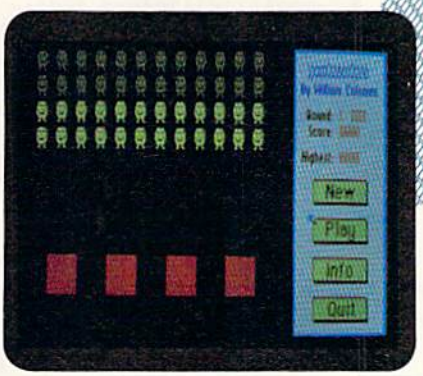
I hope this program puts to rest the misconception that GEOS 128 can't display color on an 80-column screen. Enjoy! R

William Coleman is the author of geoTerm, geoOrganizer and a number of other GEOS utilities. You can send him Email on GEnie (WC.COLEMAN).

Listing 1. GeoInvaders creator program. (Available on ReRUN disk. See page 36.)

```
Ø REM * CREATES GEOS PROGRAM GE
  OINVADERS *           :REM*2Ø4
2 DR=8:FI$="GEOINVADERS":TY$=CH
  R$(6):GOTO18          :REM*17
4 HI=INT(A/256):PRINT#15,"M-R"C
  HR$(A-HI*256)CHR$(HI):REM*252
6 GET#15,A$:A=ASC(A$+CHR$(Ø)):R
  ETURN                 :REM*93
8 PRINT#15,"U1:"2;Ø;TR;SC:RETUR
  N                     :REM*25Ø
1Ø PRINT#15,"U2:"2;Ø;TR;SC:RETU
  RN                    :REM*245
12 PRINT#15,"B-P:"2;PS:RETURN
                        :REM*75
14 GET#2,A$:A$=LEFT$(A$+CHR$(Ø)
  ,1):RETURN            :REM*185
16 PRINT#2,CHR$(A);:RETURN
                        :REM*15Ø
18 DIM D$(29):PRINT "WORKING...
  ":OPEN3,DR,3,FI$+",U,W"
                        :REM*186
2Ø READ A$:PRINT ".";:IF A$="-1
  " THEN CLOSE 3:GOTO 3Ø
                        :REM*161
22 FOR I=1 TO LEN(A$):IF MID$(A
  $,I,1)=" " THEN A$=LEFT$(A$,
  I-1)+MID$(A$,I+1)     :REM*212
24 NEXT:FOR I=1 TO LEN(A$) STEP
   2:H$=MID$(A$,I,1):L$=MID$(A
  $,I+1,1)              :REM*255
26 H=16*(VAL(H$)-(H$>"@"ANDH$<"
  G")*(ASC(H$)-55))     :REM*221
28 PRINT#3,CHR$(H+(VAL(L$)-(L$>
  "@"ANDL$<"G")*(ASC(L$)-55)))
  ;:NEXT:GOTO 2Ø         :REM*75
3Ø OPEN 15,DR,15:OPEN 2,DR,2,"#
  ":OPEN 3,DR,3,FI$:CLOSE 3
                        :REM*252
32 A=656:GOSUB 4:DB=A:A=66Ø:GOS
  UB 4:DE=A:TR=18:SC=DB:GOSUB
  8                     :REM*147
34 PS=DE:GOSUB 12:FORI=Ø TO 29:
  GOSUB 14:D$(I)=A$:NEXT:TR=AS
  C(D$(1))              :REM*7Ø
36 SC=ASC(D$(2)):GOSUB 8:GOSUB
  14:XT$=A$:GOSUB 14:XS$=A$:GO
  SUB 8                 :REM*78
38 A=Ø:GOSUB 16:A=255:GOSUB 16:
  A=3:GOSUB 16:A=21:GOSUB 16:G
  OSUB 1Ø               :REM*138
4Ø D$(19)=D$(1):D$(2Ø)=D$(2):D$
  (1)=XT$:D$(2)=XS$:D$(21)=CHR
  $(Ø):D$(22)=TY$       :REM*12
41 D$(23)=CHR$(89):D$(24)=CHR$(
  7):D$(25)=CHR$(7):D$(26)=CHR
  $(11)                 :REM*218
42 D$(27)=CHR$(23):TR=18:SC=DB:
  GOSUB 8:PS=DE:GOSUB 12
                        :REM*2Ø6
44 FORI=Ø TO 29:PRINT#2,LEFT$(D
  $(I),1);:NEXT:GOSUB 1Ø:CLOSE
   2:CLOSE 15           :REM*1Ø4
46 PRINT:PRINT"DONE!":END
                        :REM*23
48 :                    :REM*1Ø6
5Ø REM{2 SPACEs}* THIS IS THE H
  EX DATA FOR GEOINVADERS *
                        :REM*239
51 DATA Ø315BFFFFFFF8ØØØØ1BF FF
  FDAØØØ85A6D8FDA6D8 85AØØØ85A
  6D885A6D8B5           :REM*214
52 DATA AØØØ85AØØØB5A3ØØ85A7 8Ø
  B5AØØØ85BFFFFD8ØØØ Ø1B36181B
  361819E6181           :REM*97
53 DATA 8C6D81FFFFFF83Ø6ØØØØ Ø4
  FFØ3Ø4Ø447656F496E 766164657
  2732Ø56312E           :REM*92
54 DATA 31ØØØØØØCØ57696C6C69 61
  6D2Ø432E2Ø436F6C65 6D616E2ØØ
  ØØØØØØØØØØ           :REM*255
55 DATA ØØØØØØØØØØØØØØØØØØØØ ØØ
  ØØØØØØØØØØØØØØØØØØ ØØØØØØØØØ
  ØØØØØØØØØØ           :REM*121
56 DATA ØØØØØØØØØØØØØØØØ537Ø 61
  63652Ø496E76616465 722Ø47616
  D652E2Ø383Ø           :REM*182
57 DATA 2Ø636F6C756D6E2Ø434F 4C
  4F5221ØØØØØØØØØØØØ ØØØØØØØØØ
  ØØØØØØØØØØ           :REM*231
58 DATA ØØØØØØØØØØØØØØØØØØØØ ØØ
  ØØØØØØØØØØØØØØØØØØ ØØØØØØØØØ
  ØØØØØØØØØØ           :REM*126
59 DATA ØØØØØØØØØØØØØØØØØØØØ ØØ
  ØØØØØØD8ØE14ØØA912 CDØFCØ3ØØ
  34C9ØØ6AD13           :REM*241
6Ø DATA CØ1ØF82ØD7C2A98Ø852F 2Ø
  A8C1Ø5ØØØ1ØØØØØØ3 7F02AF05Ø
  1Ø3EØØ1ØØØ5           :REM*41
61 DATA ØØØ1E4Ø1Ø2Ø37BØ2ADØØ 2Ø
```

RUN it right: **C-128 (80-Column mode); GEOS; mouse, keyboard or joystick for input.**



GeoInvaders is the first known 80-Column color program for GEOS 128, and it's fun to play, too!

```
   C3192Ø9A19ØØ153C4F E32Ø9A19Ø
   ØØ3Ø03BØ42Ø          :REM*173
62 DATA 9A19Ø4Ø7Ø03BØ52Ø9A19 Ø8
   ØBØØ3BØD2Ø9A19ØCØF ØØ3BØ92Ø9
   A191Ø13Ø03B          :REM*134
63 DATA Ø82Ø9A191415ØØ3BØBA9 8Ø
   A21A2Ø4D18A9ØØA218 2Ø4D18A9Ø
   Ø858Ø858178          :REM*77
64 DATA A9Ø68DAØ84A9ØØ8D9F84 58
   2Ø8CØ52Ø3AØ92Ø25Ø5 4C7ØØ5A57
   6DØØ32Ø7ØØ5          :REM*131
65 DATA A9Ø68DA484A9258DA384 A9
   148DAA84A9638DA984 A9Ø68D9C8
   4A9A18D9B84          :REM*73
66 DATA 2Ø13Ø6A9A88DB8848DB9 84
   A9ØØ8DBB84A9Ø78DBA 84A9Ø18DB
   D84A9CF8DBC          :REM*199
67 DATA 84A9ØF8D18D4A9Ø88DØB D4
   8D12D4A57B853BA57A 853AA9Ø58
   5Ø3A9Ø385Ø2          :REM*76
68 DATA 4CDAC2FFFFFFFFFFFFFF FF
   FFFFFFFFFFFFFFFFØ1 8ØØ3CØØ7E
   ØØFFØ1FF8FF          :REM*93
69 DATA FFFFFFFFFFFFFFA2ØØ8E A3
   848EA4848EA9848EAA 848EB8848
   E18D42ØØCC1          :REM*222
7Ø DATA A9ØØ8D9B848D9C84A9AØ 8D
   B984A9Ø18DBB84A9E3 8DBA84A9Ø
   28DBD84A976          :REM*249
71 DATA 8DBC84A53B857BA53A85 7A
   A9ØØ85Ø3A9ØØ85Ø24C DAC2A9Ø48
   576A9Ø18574          :REM*166
72 DATA A9ØØ857E857F2Ø2Ø1ØA9 ØØ
   857BA9E7857A4CA2ØC 2Ø9A19Ø1Ø
   33D4EE22ØAE          :REM*15Ø
73 DATA C1F7Ø11Ø181A67656F49 6E
   7661646572731BØØ2Ø AEC1EAØ11
   B1842792Ø57          :REM*15
74 DATA 696C6C69616D2Ø436F6C 65
   6D616E1BØØ2Ø9A19Ø4 Ø83D44E02
   Ø9A19Ø4Ø845          :REM*2Ø6
75 DATA 4EE82ØAEC1F4Ø12B1852 6F
   756E643AØØ2ØAEC1F7 Ø13553636
   F72653AØØ2Ø          :REM*25Ø
76 DATA AEC1ECØ1454869676865 73
   743A1BØØ6ØA577FØØ2 C677A579F
   ØØ2C679A578          :REM*8
77 DATA FØØ2C6786ØA9Ø485Ø3A9 ØØ
   85Ø2A9Ø12Ø03C1A2ØØ 4CØ6C1ADØ
   485297FC961          :REM*116
78 DATA 9ØØ7C97BBØØ338E92ØAØ Ø4
   D94BØ6FØØ5881ØF83Ø Ø9BE5ØØ6B
   955Ø62ØD8C1          :REM*12Ø
79 DATA 6Ø1B1E5A2Ø3ØØ5Ø6Ø614 14
   25755A6969Ø878A53B C9ØØDØØ4A
   53AC9Ø9CØØB          :REM*139
8Ø DATA 38A53AE9ØC853ABØØ2C6 3B
   286ØØ878A53BC9Ø1DØ Ø4A53AC9D
   DBØØB18A9ØC          :REM*252
81 DATA 653A853A9ØØ2E63B286Ø 2Ø
   F919A9ØØ85Ø3A9ØØ85 Ø22ØDAC24
   C2CC22Ø87C1          :REM*2Ø3
82 DATA A579DØØ72Ø5A12A9Ø285 79
   A578DØØ72ØE313A9Ø5 8578A577D
   ØØ72Ø8813A9          :REM*183
83 DATA Ø685776ØAØØ5A57ØDØØ1 88
   8CØ1D4A9ØØ8DØØD4A9 ØØ8DØ5D4A
   9F18DØ6D4A9          :REM*213
84 DATA 318DØ4D46ØA93Ø8DØ4D4 6Ø
   A9Ø58DØFD4A9DC8DØE D4A9ØØ8D1
   3D4A9F18D14          :REM*64
85 DATA D4A9318D12D4A9ØØ85Ø3 A9
   Ø585Ø22Ø99C148A93Ø 8D12D4686
   Ø2ØE5Ø6A9Ø1          :REM*185
86 DATA 8DØ8D4A99Ø8DØ7D4A9ØØ 8D
   ØCD4A9FB8DØDD4A981 8DØBD42Ø4
   218A98Ø8DØB          :REM*8
87 DATA D46ØA9C18DB284A9248D B1
   842Ø8AØ72Ø8E182ØA3 Ø72Ø23192
   Ø9A19Ø2ØCØC          :REM*128
88 DATA 35D22Ø9A19ØDØDØA33C2 2Ø
   9A19Ø3ØCØAØBC2A9Ø8 85Ø3A9D78
   5Ø22Ø56C2A9          :REM*94
89 DATA Ø78DB284A9B48DB184A9 Ø8
   85Ø3A93E85Ø24C56C2 A91Ø85Ø6A
   96785Ø7A9ØØ          :REM*39
9Ø DATA 85Ø9A96Ø85Ø8A9Ø185ØB A9
   AE85ØA6ØA9Ø285Ø6A9 ØD85Ø7A9Ø
   A85Ø8A93585          :REM*32
91 DATA ØA6Ø2ØA3Ø72Ø3Ø192Ø8A Ø7
   4C9B181A67656F496E 766164657
   2732Ø566572          :REM*254
92 DATA 73696F6E2Ø312E311BØØ 18
   5772697474656E2Ø62 793A2Ø576
   96C6C69616D          :REM*149
93 DATA 2Ø436F6C656D616E2Ø4A 72
   2E1BØØ436F7Ø797269 676874203
   13938392C2Ø          :REM*42
94 DATA 426C6173746572536F66 74
   2Ø496E6B2C2Ø435749 2Ø496E632
   EØØ416C6C2Ø          :REM*177
95 DATA 52696768747320617265 2Ø
   52657365727665640Ø ØØ1Ø676ØØ
   ØAFØ1ØB321Ø          :REM*127
96 DATA CØØ7ØB322ØDAØ7ØB324Ø FC
   Ø7ØB325Ø26Ø8ØE0Ø1A 2A2A2A2Ø5
   3636F72696E          :REM*216
97 DATA 672Ø2A2A2A1BØØ352D31 3Ø
   3Ø2Ø7Ø6F696E7473ØØ 2Ø2Ø313Ø3
   Ø2Ø7Ø6F696E          :REM*88
98 DATA 7473ØØ2Ø2Ø353Ø3Ø2Ø7Ø 6F
   696E7473ØØ184D6F76 656D656E7
   42Ø4B657973          :REM*234
99 DATA 3A1BØØ275A272Ø3D2Ø4C 65
   66742Ø2Ø435253522D 3E2Ø3D2Ø5
   2696768740Ø          :REM*165
1ØØ DATA 2Ø2Ø537Ø616365206F72 2
   Ø5A65726F2Ø3D2Ø4649 5245ØØØ
   Ø1Ø676ØØØAFØ1        :REM*132
1Ø1 DATA ØB641Ø5BØ8ØB32236DØ8 Ø
   B32377AØ8ØB3249870 8ØBB92A9
   4Ø8ØBA537A5Ø8         :REM*76
1Ø2 DATA ØBA542CØØ813Ø6Ø9ØEØØ A
   57Ø48A9ØØ857ØA9Ø185 7DA92B8
   57C2ØFAØB2Ø2B         :REM*152
1Ø3 DATA ØE68857ØA9Ø1857DA943 8
   57C2ØFAØB2ØØE11A9Ø1 857DA93
   Ø857C2ØFAØB4C         :REM*126
1Ø4 DATA ØFØEA9Ø985Ø3A9668 5Ø2 2
   Ø5AC12Ø9A19ØAØB4Ø4B 5Ø2Ø9A1
   9ØDØE4Ø4B5Ø2Ø         :REM*24Ø
1Ø5 DATA 9A191Ø114Ø4B5Ø2Ø9A19 1
   3144Ø4B5Ø6ØØ4F8Ø164 9ØØA4Ø5
   Ø861Ø7ØØ5E1Ø9         :REM*29
1Ø6 DATA 4Ø6886 1Ø9FØ43AØA4Ø8Ø 8
   61Ø3CØ78AØ94Ø98861Ø 9ØØ6Ø5F
   F82FE8ØØ4ØØ82        :REM*96
1Ø7 DATA Ø38ØØ4ØØBEØ38ØØ3EØØ6 6
   ØØ38Ø063ØØ6ØØ38ØØ6 366EFØØ
   38Ø0636666ØØ3         :REM*169
1Ø8 DATA 8ØØ6366660Ø38Ø063666 6
   ØØ38Ø0636666ØØ38Ø06 B666ØØ
   38Ø03E3E638Ø3         :REM*217
1Ø9 DATA 8ØØØ3ØØØØØ38Ø04Ø081 Ø
   3Ø6FF817FØ5FFØCØ7Ø5 FF82FE8
   ØØ4ØØC9Ø38Ø1F         :REM*134
11Ø DATA 9CØØØØ38Ø18CCØØØØ3 8 ►
```

```
      Ø18CCF33ØØ38Ø18CD9B 3ØØ38Ø1
      F8CFB3ØØ38Ø18       :REM*145
111 DATA ØD9B3ØØ38Ø18ØD9B3ØØ3 8
      Ø18ØD9B3ØØ38Ø18ØCF9 FØØ38ØØ
      ØØØØØ3ØØ38ØØØ      :REM*35
112 DATA ØØØ33ØØ38ØØØØØØ1EØØ3 Ø
      6FF817FØ5FFØCØ7Ø5FF 82FE8ØØ
      4ØØ82Ø38ØØ4ØØ       :REM*9Ø
113 DATA B8Ø38ØØCØØEØØØ38ØØC Ø
      18ØØØØ38ØØDF3C78ØØ3 8ØØDD98
      CCØØ38ØØD998C       :REM*197
114 DATA CØØ38ØØD998CCØØ38ØØD 9
      98CCØØ38ØØD998CCØØ3 8ØØD998
      78ØØ38ØØ4ØØ82       :REM*29
115 DATA Ø38Ø04ØØ81Ø3Ø6FF817F Ø
      5FFØCØ7Ø5FF82FE8Ø04 ØØ82Ø38
      ØØ4ØØB8Ø38Ø1C       :REM*2
116 DATA CØØØØØ38Ø1CCØØØØØ3 8
      Ø1ECF333ØØ38Ø1ED9B3 3ØØ38Ø1
      BD99FEØØ38Ø1B       :REM*179
117 DATA DF9FEØØ38Ø19D8ØCCØØ3 8
      Ø19D98CCØØ38Ø18CFØC CØØ38ØØ
      4ØØ82Ø38ØØ4ØØ       :REM*19Ø
118 DATA 81Ø3Ø6FF817FØ5FFØCØ7 Ø
      ØØØØØØØØØØØ1FF8ØØ3 FFCØØ61
      86ØØFFFFØØFFF       :REM*121
119 DATA FØØCFF3ØØE7E7ØØFØØFØ Ø
      7FFEØØ3FFCØØØC3ØØØ1 818ØØ3Ø
      ØCØØØØØØØØØØ       :REM*195
12Ø DATA ØØØØØØØØØØ1FF8ØØ3FFC Ø
      Ø6186ØØFFFFØØFFFFØØ CFF3ØØE
      7E7ØØFØØFØØ7F       :REM*223
121 DATA FEØØ3FFCØØØC3ØØØØ66Ø Ø
      ØØ3CØØØØØØØØØ3FFCØ Ø6ØØ6ØØ
      CØØ3ØØCC33ØØC       :REM*1
122 DATA C33ØØC183ØØC3C3ØØDØØ B
      ØØCFF3ØØCØØ3ØØ6ØØ6Ø Ø3FFCØØ
      Ø3FFCØØ6ØØ6ØØ       :REM*113
123 DATA CØØ3ØØCC33ØØCC33ØØC1 8
      3ØØC3C3ØØDØØBØØCFF3 ØØCØØ3Ø
      Ø6ØØ6ØØ3FFC2Ø       :REM*233
124 DATA CC17CE76ØØDØ422Ø25Ø5 2
      ØAEC19CØØ58181A2Ø47 2Ø412Ø4
      D2Ø452Ø2Ø2Ø4F       :REM*129
125 DATA 2Ø562Ø452Ø522Ø1BØØAD 8
      1ØØCD7FØØDØØ6AD8ØØØ CD7EØØB
      ØØCAD7FØØ8D81       :REM*2Ø2
126 DATA ØØAD7EØØ8DØØØ2Ø2Ø1Ø 4
      CF4ØB4C2Ø1Ø2ØE5Ø62Ø ØFØ7EE7
      4ØØ2Ø41142ØA2       :REM*197
127 DATA ØC2Ø2Ø1Ø2Ø37182Ø13Ø6 A
      2FF9A4CC3C1AD7CØØ85 12AD7DØ
      Ø8513A9ØØ85ØC       :REM*157
128 DATA 85ØDA413DØØ6A412CØFC 9
      Ø1438A512E9FC8512BØ Ø2C613A
      5ØC1869ØC85ØC       :REM*21Ø
129 DATA 9ØE2A412CØ159ØØBA512 3
      8E9158512E6ØCDØEFB9 49ØC186
      5ØC85ØCB95FØC       :REM*148
13Ø DATA 65ØD85ØD6ØØØ8ØØØ8ØØØ 8
      ØØØ8ØØØ8ØØØ8ØØØ8ØØØ 8ØØØ8ØØ
      Ø8ØØØ8ØØØ2Ø5        :REM*12
131 DATA Ø7ØAØCØF111416191B1E 2
      Ø2325282A2D2F32342Ø FAØB18A
      98Ø65ØC85ØCA9       :REM*186
132 DATA Ø265ØD85ØD6ØA8B9161A 8
      D7CØØB9461A8D7DØØ6Ø A8AD7CØ
      Ø99161AAD7DØØ       :REM*216
133 DATA 99461A6Ø2Ø9FC1ØØAFØØ Ø
      ØDFØ1A9ØØ85FD85FC8D 7ØØØ8DØ
      91A2Ø4114A9FF       :REM*149
134 DATA 8D72ØØA9Ø68DØ81AA93Ø 8
      5FEA9ØD8DØ2Ø4AC74ØØ 88CØ11B
      ØØCB9BEØD8DØ8       :REM*233
135 DATA 1AB9DØØD8DØ2Ø4AØ2F8C 7
      5ØØB95EØD8D7CØØB98E ØD8D7DØ
      Ø18ADØ81A6D7C       :REM*142
136 DATA ØØ8D7CØØ9ØØ3EE7DØØ98 2
      Ø94ØC2ØFAØB2Ø2BØECE 75ØØAC7
      5Ø1ØD3A9ØØ8D        :REM*129
137 DATA 7DØØA9E28D7CØØ2Ø44ØD A
      9Ø18D7DØØA9DE8D7CØØ 2Ø44ØDA
      9Ø28D7DØØA9DA       :REM*71
138 DATA 8D7CØØ2Ø44ØDA9Ø38D7D Ø
      ØA9D68D7CØØ2ØFAØB2Ø E2ØD18A
      93F6D7CØØ8D7C       :REM*176
139 DATA ØØ9ØØ3EE7DØØ2ØFAØB4C E
      2ØD93959799E7E9EBED 3B3D3F4
      18F919395E3E5       :REM*2Ø5
14Ø DATA E7E937393B3D8B8D8F91 D
      FE1E3E5333537398789 8B8DDBD
      DDFE12F313335       :REM*1ØØ
141 DATA ØØØØØØØØØØØØØØØØ1Ø1 Ø
      1Ø1Ø1Ø1Ø1Ø1Ø1Ø1Ø1 Ø2Ø2Ø2Ø
      2Ø2Ø2Ø2Ø2Ø2Ø2       :REM*128
142 DATA Ø2Ø2Ø3Ø3Ø3Ø3Ø3Ø3Ø3 Ø
      3Ø3Ø3Ø3Ø4Ø4Ø4Ø4ØØØØ ØØØØØ2Ø
      2Ø2Ø2Ø4Ø4Ø4Ø4       :REM*52
143 DATA Ø4Ø6Ø6Ø6Ø6Ø6Ø6141212ØØE 1
      4121ØØE14121ØØEØD14 121ØØEØ
      DAØ18A9FF8DF6       :REM*84
144 DATA ØDDØØ7AØ1ØA9ØØ8DF6ØD 2
      Ø7E18A9ØØ2Ø4D182Ø4D 182Ø4D1
      818A95Ø65ØC85       :REM*142
145 DATA ØC9ØØ2E6ØD88DØE46ØA9 Ø
      C85Ø4A9ØB85Ø3A94785 Ø2AD71Ø
      ØFØ34A9ØB85Ø3       :REM*12
146 DATA A96B85Ø2B85Ø29A91Ø85 Ø
      4A9ØA85Ø3A9E685Ø2AD 7ØØØFØ1
      82C72ØØ3ØØBA9       :REM*196
147 DATA ØB85Ø3A91685Ø2B85ØØ8 A
      9ØB85Ø3A91785Ø2AØFF 2Ø7E18C
      8B1Ø22Ø4D18C8       :REM*184
148 DATA B1Ø22Ø4D18C8B1Ø22Ø4D 1
      818A95Ø65ØC85ØC9ØØ2 E6ØDC6Ø
      4DØDC6ØAD75ØØ       :REM*3
149 DATA 2Ø94ØC2ØFAØB2Ø2BØE4C A
      1Ø62ØFAØB2ØEBØDA98Ø 8D7DØØA
      D75ØØ2Ø94ØCA9       :REM*58
15Ø DATA ØØ85ØDA91585ØCA27CAØ Ø
      C2Ø69C1E612A512ØAØA 1865122
      Ø871ØC6FEDØØ3       :REM*1Ø5
151 DATA 4CDCØBA5FEC9Ø1DØØ58D Ø
      2Ø4FØØC29Ø3DØØBCEØ2 Ø4DØØ3E
      EØ2Ø42Ø13Ø66Ø       :REM*112
152 DATA 2Ø42ØF2ØC6Ø6AD7ØØØ49 F
      F8D7ØØØ2C72ØØ3Ø2CA9 ØØ8D75Ø
      Ø2Ø86ØC3Ø16AD       :REM*168
153 DATA 7ØØØDØØE18A9156D7CØØ 8
      D7CØØ9ØØ3EE7DØØ2Ø7B ØEEE75Ø
      ØAD75ØØC93Ø9Ø       :REM*55
154 DATA DBBØ28A92F8D75ØØ2Ø86 Ø
      C3Ø16AD7ØØØDØØE38AD 7CØØE91
      58D7CØØBØØ3CE       :REM*195
155 DATA 7DØØ2Ø7BØECE75ØØAD75 Ø
      Ø1ØDD4CE5Ø6AD7ØØØFØ 4E2C72Ø
      Ø3Ø22A92F8D75       :REM*11Ø
156 DATA ØØ2Ø86ØC3ØØFAD7DØØC9 Ø
      4DØØ5AD7CØØC9ADBØ2C 6ØCE75Ø
      ØAD75ØØ1ØE46Ø       :REM*128
157 DATA A9ØØ8D75ØØ2Ø86ØC3ØØD A
      D7DØØDØ18AD7CØØC915 9ØØC6ØE
      E75ØØAD75ØØC5       :REM*9Ø
158 DATA 3ØDØE46Ø2Ø96ØF68686Ø A
      92F8D75ØØA8B9FØØF2Ø 86ØC3Ø3
      22ØFAØB2ØEBØD       :REM*163
159 DATA 2Ø2BØEA5ØDC934DØØ4A5 Ø
      CC98Ø9ØØ62Ø8FØB4CDC ØB18A9Ø
      26D7CØØ8D7CØØ       :REM*73
16Ø DATA 9ØØ3EE7DØØAC75ØØB9FØ Ø
      F2Ø94ØCCE75ØØAD75ØØ 1ØBDAD7
      2ØØ49FF8D72ØØ       :REM*153
161 DATA AØØØ8C7ØØØ888CØ91A6Ø Ø
      ØØ4Ø8ØC1Ø14181C2Ø24 282CØ1Ø
      5Ø9ØD1115191D       :REM*197
162 DATA 2125292DØ2Ø6ØAØE1216 1
      A1E22262A2EØ3Ø7ØBØF 13171B1
      F23272B2FA9ØØ       :REM*63
163 DATA 2Ø871ØA9ØØ85Ø3AD74ØØ 8
      5Ø2A9Ø28519A92C8518 A9ØØ85Ø
      6A92B85Ø5A9CØ       :REM*117
164 DATA 2Ø84C1A9182Ø45C12ØB7 1
      ØAD76ØØ852ØFØØ9A953 2Ø02C2C
      62ØDØF72ØB71Ø       :REM*37
165 DATA A91B2Ø45C1AD81ØØ85Ø3 A
      D8ØØØ85Ø2A9Ø28519A9 2C8518A
      9ØØ85Ø6A94585       :REM*14
166 DATA Ø5A98Ø2Ø84C1A92Ø4CØ2 C
      2186D7EØØ8D7EØØ9Ø3 EE7FØØA
      D7FØØ85Ø3AD7E       :REM*155
167 DATA ØØ85Ø2A9Ø28519A92C85 1
      8A9ØØ85Ø6A9358Ø5A9 8Ø2Ø84C
      1A92Ø4CØ2C2A9       :REM*128
168 DATA 2Ø2Ø2C2A92Ø4CØ2C2AØ Ø
      82Ø7E18A9ØØ2Ø4D1818 A95Ø65Ø
      C85ØC9ØØ2E6ØD       :REM*46
169 DATA 88DØEA6ØAØFF2Ø7E18C8 B
      9F61Ø2Ø4D1818A95Ø65 ØC85ØC9
      ØØ2E6ØDCØØ7DØ       :REM*89
17Ø DATA E76ØØ181818183C7E Ø
      Ø6Ø18Ø6186Ø18Ø6ØØ6 186Ø18Ø
      6186ØA91Ø85Ø3       :REM*97
171 DATA A9FE85Ø2AD7CØØ29Ø1DØ Ø
      8A91185Ø3A9Ø685Ø2AØ FF2Ø7E1
      8C8B1Ø22Ø4D18       :REM*24Ø
172 DATA 18A95Ø65ØC85ØC9ØØ2E6 Ø
      DCØØ7DØE86Ø2Ø86ØC3Ø 4EAD7DØ
      Ø8D771AAD7CØØ       :REM*23Ø
173 DATA 8D761AAD761A1869158D 7
      81AAD771A69ØØ8D791A AD781A1
      869158D7A1AAD       :REM*214
174 DATA 791A69ØØ8D7B1A2Ø9411 F
      Ø1BEE761ADØØ3EE771A EE781AD
      ØØ3EE791AEE7A       :REM*251
175 DATA 1ADØØ3EE7B1A2Ø94116Ø A
      DØB1ACD771ADØØ6ADØA 1ACD761
      AFØ1EADØB1ACD       :REM*96
176 DATA 791ADØØ6ADØA1ACD781A F
      ØØEADØB1ACD7B1ADØØ6 ADØA1AC
      D7A1A6ØA5FCFØ       :REM*182
177 DATA 1938E9Ø1ØAA8B9ØE1ACD 7
      CØØDØØ8B9ØF1ACD7DØØ FØØ6888
      81ØEC186Ø386Ø       :REM*26
178 DATA B9111A99ØF1AB91Ø1A99 Ø
      E1AC8C8984AC5FCDØEC C6FC6ØA
      5FCFØ35A5FDFØ       :REM*87
179 DATA 31ADØB1A8D771AADØA1A 8 ►
```

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☐ **Telephone Book** - Keeps a record of important names and phone numbers.
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☐ **Astro-Biorhythm** - Shows your personal biorhythm for any given span of time.
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☐ **Space Shooter** - Try to stay alive by firing rockets at enemy ships.
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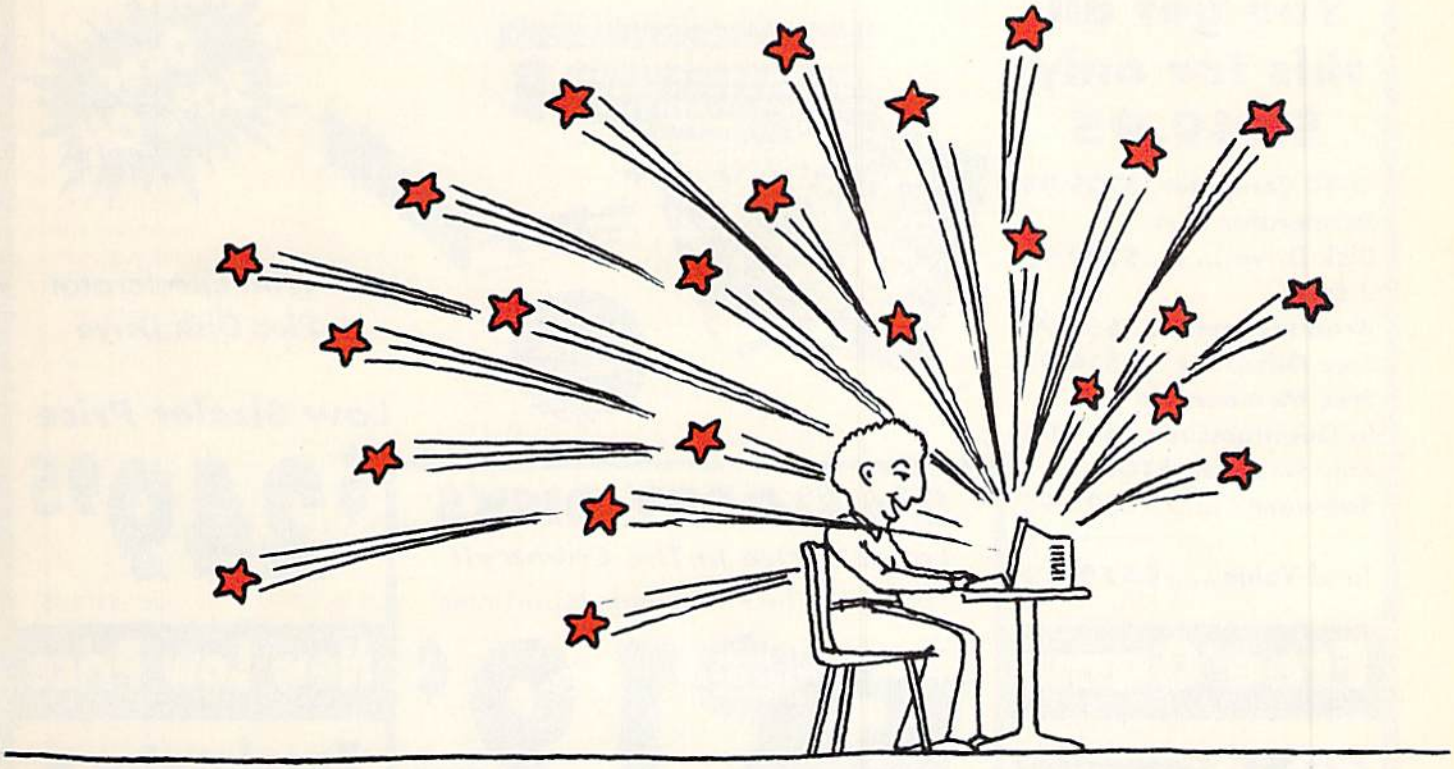

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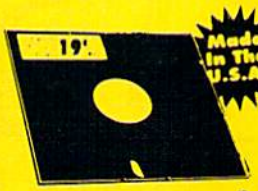

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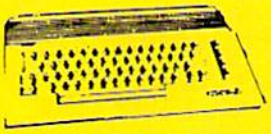

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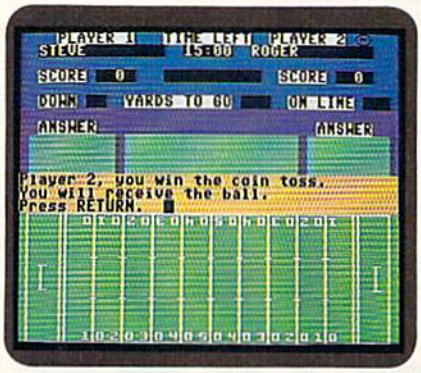
From p. 24.

vance of either the computer or a human opponent. This is fun, although a certain anxiety arises from the time limits. You can run three kinds of play (plus punt): a run (solve an easy problem in 40 seconds); a short pass (a medium problem in 50 seconds); a long pass (a hard problem in one minute). Incorrect solutions result in lost ground when you have the ball. Right answers gain yardage for human players or stymie the computer when *it* has possession. You



Solving problems to win the game is the premise behind Math Football: Percent.

can view the back-and-forth progress of both elevens on a simulated field, and a scoreboard displays downs, yards to gain for a first down, the score, time remaining, and so forth.

You can also choose among four levels of difficulty: High School (changing percents to common-fraction or decimal form); College (finding a percent of a given number); Pro (finding the whole when the percentage and the part are known, or the percent when the part and the whole are known); and Superbowl (a mixture of all types).

Unlike the Fractions program, where the perception of *what* to do is often more difficult than the actual figuring involved, Math Football: Percent contains, especially beyond the High School level, many problems that can't be done mentally by ordinary mortals—and you're up against time limits that are not generous to the slow or careless. Of course, if, like most smart children today, you use a hand calculator, you don't need to know how to multiply or divide.

The game aspect of Percent is quite engaging, and the time pressures keep you on your toes as you get good practice in relatively difficult problems. One minor flaw was that a few messages would flicker on the screen for an instant and disappear before you could read them. And in one instance, the drive started and simply wouldn't stop. Nothing happened, though I waited for minutes; so I finally had to simulate a power failure and switch off the computer. Fortunately, it didn't seem to harm the disk. Like the Fractions program, the documentation is satisfactory.

On the whole, I recommend both these packages as worthwhile practice exercises to supplement a good instructional program. Just don't try to employ them as initial teaching instruments. *(Gamco Industries, Inc., PO Box 1911, Big Spring, TX 79721. C-64/$44.95 each.)*

—SWAIN PRATT
RUN STAFF

STORY BUILDER: PARTS OF SPEECH IN CONTEXT ..... B–

Imagination Plus Humor Creates a Teaching and Learning Tool

Teaching grammar is usually a dull proposition, dreaded by teachers and resisted by students. Traditional parts-of-speech drills tend to be isolated workbook activities based on fill-in-the-blanks recognition and reinforcement. So, it was with some interest that I picked up Story Builder: Parts of Speech in Context.

Story Builder is basically a word game in which players use designated parts of speech (ranging from concrete nouns to interjections) to complete blanks in brief stories. A teacher (or student) selects a story, in which words have been removed and replaced with "word clues" that indicate the missing part of speech. Without seeing the context into which the words go, students place words in response to the clues. Story Builder inserts the words in the text and, theoretically, an amusing story results.

Story Builder's data disk contains 30 stories with word clues already inserted and ready for use. The program also lets users create, edit and print stories, and to this end, includes some easy-to-use word processing features. So, as a bonus, students become familiar with the basic concept of word processing in a relatively simple context.

The program's handbook provides clear directions for copying disks (a C-64 needs a commercial copying program), start-up instructions, a troubleshooting page and classroom use suggestions. It also comes with copy masters (including prewriting activities) designed for individual student use and intended for reproduction.

Story Builder has several obvious educational uses. It can function as a diagnostic tool to determine how well a student understands parts of speech within the written context. It might also be an effective assessment tool, used at the end of a grammar unit. In both cases, the flexibility of the program—particularly the editing features—lets the teacher customize the stories (in particular, the parts of speech on which the stories are based) to fit the students' needs. Because these drills are within the context of student-manipulated stories, the grammar reinforcement itself is more meaningful, and, presumably, more effective.

There are, however, some obvious problems here. For example, a student can insert anything in the blanks: "boy" or "xyz" for a verb. A basic dictionary of allowable or unacceptable words for the various parts of speech might be an invaluable addition.

Further, there are no definitions of parts of speech on the disk or in the manual. Definitions with examples would be useful, both for students and, sad to say, for some teachers. If definitions were accessible on the disk, the product could become an actual teaching tool, in addition to being good for review or assessment.

Story Builder: Parts of Speech in Context is really a computerized version of the game *Mad Libs*. The flexibility of the word processor allows both individualization of the review and participation of the student, creating what could be, in the hands of a knowledgeable and innovative teacher, a useful instrument in the fight against illiteracy. *(J. Weston Walch, Publisher, 321 Valley St., PO Box 658, Portland, ME 04104-0658. C-64/$46.95.)*

—SHARON G. WEINER
CHICAGO, IL

MAMMOTH MELTDOWN ..... C–
ESSENTIAL PUNCTUATION .... B–

Do Your Students Need To Study Nouns, Verbs and Adjectives, or Periods, Commas and Colons?

Gamco's Mammoth Meltdown and Essential Punctuation are two separate programs that educators and parents might consider purchasing for children who are having difficulty understanding parts of speech and basic punctuation. Neither, however, takes the place of good teaching, since each focuses more on drill than on instruction and review. ►

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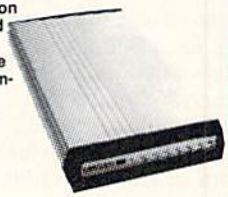

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Scrolling across the top of Mammoth Meltdown's main screen are a series of brief sentences from which the child must choose words that represent the correct part of speech. This is accomplished by pushing the space bar, which fires the laser gun held by a scientist who is standing below the sentences. If the laser hits a correct answer, a section of the mound of ice encasing the mammoth dissolves. After the learner inputs a predetermined number of correct answers, the prehistoric animal is set free.

The program would be most effective with third through fifth graders, although I doubt the game would hold their attention for very long. The only variety is in the part of speech chosen, the speed of game play and the number of words needed to complete the activity. Neither the graphics nor the sound make use of the C-64's capabilities. Loading time is lengthy, and there's no way to play another game without going through a time-consuming reloading process.

Essential Punctuation's target audience is fourth through eighth graders and those high school students needing remediation. In each of the seven lessons (end punctuation, commas, and so on), students are given a three-line sentence. They must choose the line that contains an error, or, if no mistake is found, pick the No Error option. After two incorrect answers, the program provides the appropriate rule, and the child is given another chance to supply the right answer. Before beginning an exercise or at any time during it, the student is able to view all of the relevant rules for a skill area.

Robot Rescue, a very basic Breakout/Arkanoid clone, serves as a reward for those pupils successfully completing a lesson. Essential Punctuation also allows for an exam of up to 50 questions and a detailed report of how well the student performed in some two dozen sub-skills tested.

Although a more varied and useful learning tool than Mammoth Meltdown, Essential Punctuation contains three notable flaws. To begin with, Robot Rescue does nothing to reinforce learning. Secondly, test questions are chosen randomly from all seven skills. So, unless all 50 questions are given (which is too much for young children), too many sub-skills are left untested. Finally, neither in the lessons nor in the tests is there any explanation as to why a selection is correct. This makes it possible for a student working alone to choose the right answer for the wrong reason.

Each program contains a Teacher Management option that consists of student and program management sections. The first enables the teacher to maintain 200 student files on disk and to display, print or delete all of those for an individual student. The second section controls a number of variables, such as whether or not a skills report should be printed, the number of words or sentences in a lesson, the number of questions in a test, and the percentage of correct answers needed to play the robot game.

You should preview each program before purchasing. While the price is not unreasonable, an inadequate teaching and learning tool is still inadequate at any price. *(Gamco Industries, Inc., PO Box 1911, Big Spring, TX 79721 C-64/ $44.95.)*

—LEN POGGIALI
SYRACUSE, NY

ELECTRIC COMPANY LEARNING LIBRARY:
BAGASAURUS ..... **A**
PICTURE PLACE! ..... **C+**
ROLL-A-WORD ..... **D**

Pick and Choose Among These Reading Activities

Parents and teachers have long associated the Electric Company name with quality educational material. Unfortunately, Hi Tech's Electric Company Learning Library only partially succeeds in continuing this title's tradition of excellence.

The Learning Library's three educational games—Roll-A-Word, Picture Place! and Bagasaurus—are intended for home or school use. Each attempts to develop reading skills in children of ages six through nine.

Roll-A-Word uses the keyboard for input. A game starts with a child selecting one of three groups of letters and choosing a picture whose name *ends* with that letter group. If the youngster then correctly picks the letter or letters that begin the picture's name, the image floats down to a blank in a sentence. Then the picture transforms into the word that represents it, and it's on to the next round of play.

In Picture Place!, a child selects from six background scenes, which include a city and a farm, and picks one of 40 words that appear at the bottom of the screen. Then the youngster moves his or her choice with the keyboard or a joystick, and a press of a button or key turns the word into its picture.

A child can also change pictures back into words, which he can then move to another location or erase. In addition, the images placed on a background scene can be saved to disk.

Though the instructions indicate otherwise, a joystick is needed for Bagasaurus, the third Learning Library program. It includes 100 questions, 70 images and 300 words.

At the game's outset, the title character appears in one of 13 exotic scenes. The youngster moves the friendly dinosaur to a word or image that answers an on-screen question. While a wrong response produces a shake of Bagasaurus's head and the chance to try again, a correct answer rewards the child with flashing colors, a little fanfare and a trip to the next scene.

After a Bagasaurus game ends, the program displays a read-aloud story. Blinking lines appear under certain of its words, and pressing return replaces them with images or words that were selected during the game. The changes to the stories that these substitutions cause can be very humorous.

The least impressive of the three programs is Roll-A-Word. One of its shortcomings is a clumsy user interface, which frequently requires both pressing a number key and then returning to select a menu option. Also, the graphics are generally poor, and a child might not be able to recognize what some pictures are supposed to represent.

In addition, older children will probably be bored with Roll-A-Word, which includes only 21 letter groups. And, since concentrating excessively on the final parts of words impairs normal reading development, it may do more harm than good for younger children if they fixate on the word-ending letter groups that appear on screen with indistinct pictures.

Like Roll-A-Word, Picture Place! has problems with its user-friendliness and its graphics. In addition, it has the blandest sound effects of the three programs. However, the program does no harm and can be a somewhat effective tool for teaching sight words to some children.

Bagasaurus, like the other two games, could use a better interface and sharper images. And adults should realize that its questions and answers will probably have to be read to six- and seven-year-olds who use the program.

But these difficulties are insignificant when compared to the benefits that Bagasaurus offers. It does a truly superb job of developing vocabulary and ►

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such skills as classification and sequencing. And, best of all, it does all this while providing great entertainment.

Bagasaurus is a program that shows just how powerful a computer can be for teaching reading. This game alone makes the Electric Company Learning Library an excellent value. *(Hi Tech Expressions, 584 Broadway, New York, NY 10012. C-64/$29.95 for the library; $12.95 each.)*

—WALT LATOCHA
OAK PARK, IL

DINOSAURS ARE FOREVER . . . C+

A Computerized Coloring Book To Entertain Your Child's Imagination

Polarware's coloring book has some very impressive features, but it also suffers from a few aggravating problems.

Intended for ages three and up, the program contains pictures of dinosaurs in prehistoric settings. After selecting a scene, a child uses either a joystick, the keyboard or a mouse to choose one of 16 colors. He or she then moves an electronic pointer to where the color is to be applied, and a simple press of a button or key automatically fills in the area.

Polarware has included many interesting options in the software. For instance, a child can erase the color either from the last area that was changed or from the entire screen. Also, he or she can save to disk all of the "artwork" that was produced during a session at the computer. In addition, the program prints either a color or a black-and-white version of a screen on an Okimate 20 printer, while a Commodore 1200 is able to make only black-and-white copies. A child can even produce banners and pictures that are part of a month-long calendar.

Unfortunately, the program's documentation contains some errors. For example, there are only 21 pictures on the disk, despite the package's claim that there are 26. Also, the instructions incorrectly indicate that a child can mix colors together before applying them to the screen. And, although the manual mentions that a banner's personalized message can be changed by pressing control and certain letter keys, these editing functions just don't exist.

Adults should also realize that the program might not be suitable for every youngster. Certain children, for example, will become frustrated when they try to place the pointer's tip in the very small coloring areas that some pictures contain. In addition, some youngsters may not have the physical dexterity that's needed to operate a joystick, while others may not be sophisticated enough for the keyboard, which sometimes requires two keys to be pressed simultaneously. As always, parents should carefully evaluate their children's abilities before making a purchase.

The program can also be criticized for having few elements that are commonly considered to be educational; however, it can aid a child's development in other ways. Its successful use, for example, can instill confidence that will help when a youngster tries color- ►

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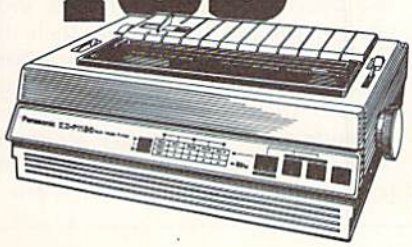

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ing by hand. Surprisingly enough, this common school activity can be difficult for many youngsters.

Also, by giving children so much control over how a prehistoric scene should look, Dinosaurs Are Forever can serve as a tremendous boost to their creativity and imagination. And, in the opinion of many parents and educators, this is the best type of learning experience there is. *(Polarware, Inc., 1055 Paramount Parkway, Suite A, Batavia, IL 60510. C-64/$29.95.)*

—WALT LATOCHA
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FREDDY'S PUZZLING ADVENTURES ..... C+

Sometimes, Slow and Steady Prevails in Puzzles

Remember the puzzles you played with as a child, where you'd vertically or horizontally slide square pieces encased in a plastic frame and try to form some sort of a picture? Sometimes freeing a slot to make room for one piece resulted in blocking the placement of another piece or boxing yourself into a corner. It certainly was maddening!

Freddy's Puzzling Adventures follows the same principle, except that the puzzles' pieces are manipulated on your computer screen and involve letters and numbers. Using the keyboard, you place each letter in its proper sequence or put numbers in certain boxes. Your successful efforts are rewarded with music and colorfully animated scenes. The program automatically keeps track of how many moves it took you to solve a problem.

According to DLM, the game is designed for children from age seven up. You begin as Freddy the Turtle, following paths highlighted by signs indicating particular puzzles and their difficulty levels. When you follow a path to the edge of your screen, a scene appears in which you must arrange letters or numbers in the proper sequence. When you've finished a puzzle, you travel on another path to a new one.

As Freddy, you move slowly, appropriately enough since you're a turtle. However, designed in 1984, Freddy doesn't know much about smooth scrolling—whenever you go to the edge of a screen, there's a 20-second wait while the program finds a new scenario.

With many software packages, taking a simple idea—in this case, the puzzle gadget you fiddled with as a youngster—and complicating it by adapting it to a computer enhances the excitement. But not in Freddy's Puzzling Adventures. In spite of the graphics, music and automatic scoring, I almost prefer the original toy.

A nice feature of this program is that you can create your own word and number problems and save and restore them for future use. Another plus is that it can teach youngsters computer familiarity. Some of Freddy's problems might also appeal to parents looking over their children's shoulders. *(DLM, One DLM Park, Allen, TX 75002. C-64/$32.95.)*

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RUN's Checksum

Listing 1. *RUN*'s Checksum program. This program is available on *RUN*'s BBS for users to download.

```
10 REM RUN'S CHECKSUM 64/128 - BOB KODADEK
20 MO=128:SA=3328:IF PEEK(40960)THEN MO=64:SA=4
   9152
30 FOR I=0TO169:READB:CK=CK+B:POKE SA+I,B:NEXT
40 IFCK<>20651 THENPRINT"DATA ERROR!":END
50 POKESA+110,240:POKESA+111,38:POKESA+140,234
60 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
70 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128
   THEN 100
80 POKESA+13,124:POKESA+15,165:POKESA+25,124:PO
   KESA+26,165
90 POKESA+39,20:POKESA+41,21:POKESA+123,205:POK
   ESA+124,189
100 POKESA+4,INT(SA/256):SYS SA:NEW
110 DATA 120,162,24,160,13,173,4,3,201,24,208,4
    ,162,13,160,67,142,4,3,140
120 DATA 5,3,88,96,32,13,67,152,72,169,0,141,0,
    255,133,176,133,180,166,22
130 DATA 164,23,134,167,132,168,170,189,0,2,240
    ,58,201,48,144,7,201,58,176
140 DATA 3,232,208,240,189,0,2,240,42,201,32,20
    8,4,164,180,240,31,201,34
150 DATA 208,6,165,180,73,1,133,180,230,176,164
    ,176,165,167,24,125,0,2,133
160 DATA 167,165,168,105,0,133,168,136,208,239,
    232,208,209,169,42,32,210
170 DATA 255,165,167,69,168,170,169,0,32,50,142
    ,169,32,32,210,255,32,210
180 DATA 255,169,13,32,210,255,104,168,96,104,1
    70,24,32,240,255,104,168
190 DATA 96,56,32,240,255,138,72,152,72,24,162,
    0,160,0,32,240,255,169
200 DATA 42,208,198
```

TYPE IN *RUN*'s CHECKSUM, which serves for both the C-64 and for the C-128 in either 40- or 80-Column mode, and save it to disk before running. When typing in a program from *RUN*, first load and run *RUN*'s Checksum. The screen will display a SYS number that deactivates and reactivates the Checksum. Always disable *RUN*'s Checksum before attempting to run another program. Note: You can abbreviate Basic keywords; spaces affect the checksum only when within quotes; and the order of characters affects the checksum.

With this new version, when you press return after typing in a program line, a one-, two-, or three-digit number from 0 to 255 appears in the home position. If this number matches the checksum value in the program listing, the line is correct. If the number that appears *doesn't* match the checksum value, compare the line with the magazine listing to find your error. Then move the cursor back up to the line and make your corrections. Now, after you press return, the correct checksum value should appear. Continue entering the listing until all the lines have been correctly typed. Then deactivate *RUN*'s Checksum, using the SYS number. Save the finished program.

All the graphics and control characters in the listings in *RUN* have been translated into understandable key combinations. They are the instructions you see inside the curly braces. For example, {SHIFT L} means you hold down the shift key while you press the L key. You do *not* type in the curly braces. What appears on the screen will look quite different from what is designated inside the braces. Here are some more examples:

{22 SPACEs}—press the space bar 22 times

{SHIFT CLR}—hold down the shift key and press the clr-home key

{2 CRSR DNs}—press the cursor-down key twice

{CTRL 1}—hold down the control key and press the 1 key

{COMD T}—hold down the Commodore logo key and press the T key

{FUNCT 1}—press the F1 key

{5 LB.s}—press the British pound key (*not* #) five times ■

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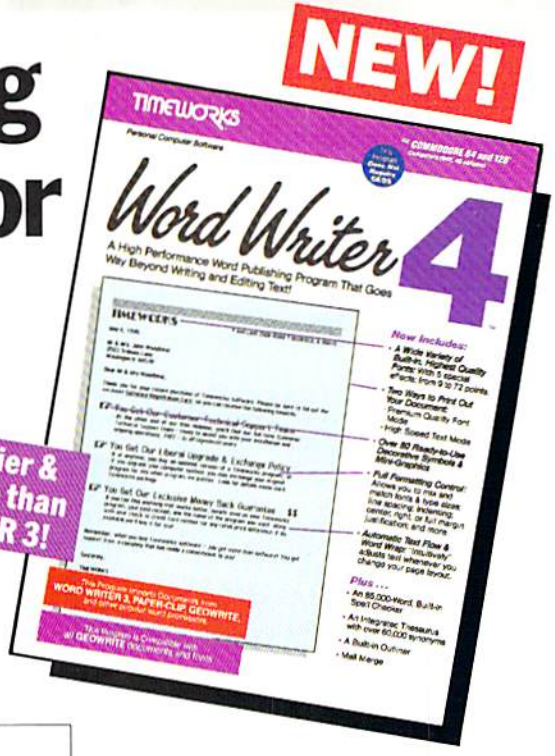
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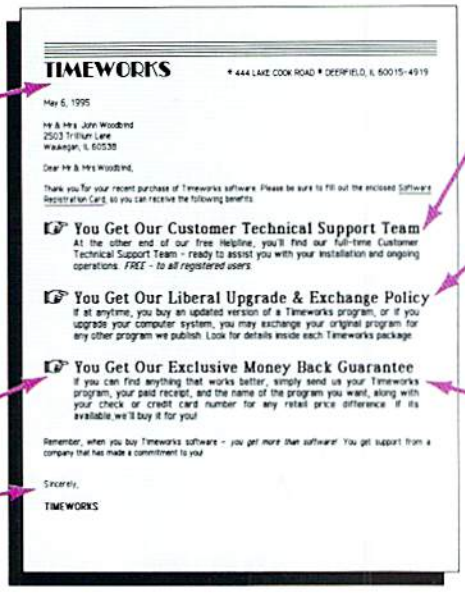
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